RADview-SC/TDMoIP

Network Management System for TDM Pseudowire Gateways

IPmux-24

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Chapter 1

Introduction

This chapter provides an overview of the IPmux-24 version 1.0 device, as well as the RADview Service Center TDMoIP IPmux-24 functions. This chapter contains the following sections:

- *IPmux-24 Overview*
- *RADview-SC/TDMoIP IPmux-24 Overview*
- *Overview of the RADview FCAPS Model*
- *Overview of the IPmux-24 Management Functions.*

1.1 IPmux-24 Overview

IPmux-24 offers a solution for extending traditional E1/T1 or serial data services transparently over packet switched networks (PSNs) such as IP, Ethernet, and MPLS networks.

IPmux-24 converts the data stream coming from its TDM ports into configurable-sized packets that are extended over Gigabit or Fast Ethernet network ports, and vise versa.

1.2 RADview-SC/TDMoIP IPmux-24 Overview

IPmux-24 includes an SNMP agent that enables full management from the network via SNMP, for example, by means of RADview network management stations. In addition, IPmux-24 includes the following additional management capabilities via both out-of-band and inband communication:

- Supervision terminal (ASCII terminal or a PC running a terminal emulation program), connected either directly or through a modem or any other type of full-duplex data link. This terminal can perform all of the IPmux-24 supervision and configuration functions, including preliminary system configuration.
- Telnet, from any host capable of IP communication with IPmux-24. The functions available via Telnet are similar to those available from a supervisory terminal.
- Web browsers, using ConfiguRAD. ConfiguRAD is a user-friendly Web-based element management system that is embedded in IPmux-24 and provided at no extra cost. ConfiguRAD can be accessed from any standard Web browser.

This manual discusses configuration via RADview, RAD's SNMP-based network management application for PC or Unix. To configure IPmux-24 via ASCII terminal, Telnet, or Web browser, see the IPmux-24 Installation and Operation Manual.

Overview of the RADview FCAPS Model

RADview provides a complete solution for monitoring and controlling IPmux-24. The RADview solutions conform to ITU-T Telecommunication Management Network (TMN) recommendations for SNMP management systems, known as the FCAPS model:

- **Fault management** – detects and correlates faults in network devices, isolates faults and initiates recovery actions.
- **Configuration management** – tracks configuration changes, configures, installs and distributes software and configuration files over the network.
- **Accounting management** – collects accounting data and generates network usage reports.
- **Performance management** – continuously monitors network performance (QoS, CoS) and resource allocation.
- **Security management** – controls and restricts access to network resources.

Overview of the IPmux-24 Management Functions

Table 1-1 lists the operations that you can perform via RADview, and their locations in this manual.

Table 1-1. Management Functions

Operation	Location in User's Manual
Configuration: • Configuring System Parameters • Configuring System Information • Maintaining the Manager List • Viewing the Host • Configuring System Clocks • Configuring Protection • Configuring Bridge Parameters • Configuring Bridge Ports • Configuring the MAC Table • Configuring the Static MAC Table • Configuring VLAN Membership (Egress) • Configuring VLAN Parameters • Configuring Ethernet Ring • Configuring QoS Classification • Configuring QoS Mapping • Configuring Quality of Service (Rate Limitation) • Deleting the LAN Table • Configuring IPmux-24 Ports at the Physical Layer • Configuring the Internal Ethernet Ports • Assigning Timeslots to Bundles • Managing Bundle Connections • Removing Bundle Connections • Displaying Ethernet Interface Information • Displaying Ethernet SFP Information • Displaying Ethernet Optical SFP Information • Displaying Bundle Connection Information • Resetting IPmux-24 to the Default Configuration • Polling the Agent • Resetting IPmux-24	*Chapter 3*
Security: • Telnet and Web Access	*Chapter 5*
Peformance: • Setting the Polling Interval • Viewing Bundle Statistics • Viewing Bundle Current Statistics • Viewing Bundle Intervals Statistics • Viewing E1/T1 Current Port Statistics • Viewing Port Intervals Statistics • Viewing Ethernet Port Statistics	*Chapter 6*

Operation	Location in User's Manual
Fault: • Masking Traps • Viewing Active Alarms • Viewing the History Log • Clearing the History Log • Viewing Self Test Results • Performing Loopback Tests	*Chapter 7*

Chapter 2

Installation and Setup

This chapter describes how to configure IPmux-24 for management and connect them to the management station, and includes the following sections:

- *Pre-configuring IPmux-24 for Network Management*
  - *Configuring the IP Parameters*
  - *Configuring the Manager List*
- *Connecting IPmux-24 to the Management Station*
- *Launching RADview IPmux-24*
- *Using the GUI*
  - *Selecting the Device or a Port*
  - *Status Indicators*
  - *Common Dialog Buttons*
  - *System Level Menu Options*
  - *Port Level Menu Options.*

2.1 Pre-Configuring IPmux-24 for Network Management

To remotely manage IPmux-24 via a network management station (NMS), it is necessary to first configure some basic parameters via an ASCII terminal session to the control port. The following steps are required:

1. Configuring the host IP parameters (IP address, IP mask, default gateway)
2. Defining the network management station in the manager list.

For more detailed information about configuring IPmux-24 for network management, see Chapter 4 of the IPmux-24 Installation and Operation Manual.

Configuring the IP Parameters

The IPmux host IP parameters may be assigned automatically via DHCP or they may be configured manually.

➤ **To manually configure the host IP parameters:**

1. Display the Host IP menu (**Configuration** > **System** > **Host IP**).
2. Disable the DHCP mechanism.
3. Save the changes.

4. Enter the new host IP parameters for IPmux:
   - Host IP address
   - IP mask
   - Default gateway
5. Save the changes.

```
Configuration>System>Host IP
1. IP address                          ... (192.168.10.1)
2. IP mask                             ... (255.255.255.0)
3. Default gateway                     ... (0.0.0.0)
4. DHCP                                    (Disable)
5. DHCP Status                         >

>

Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                      1 Mngr/s
```

Figure 2-1. Configuring the Host IP Parameters for IPmux-24

Configuring the Manager List

➤ To configure the Manager List:

1. Display the Manager List menu (Configuration > System > Management > Manager List).
2. Enter the IP address of the network management station.
3. Save the changes.

```
Configuration>System>Management>Manager list
1. Manager IP address            ... (192.168.10.100)
2. Link up/down trap                 (Disable)
3. Alarm trap                        (Disable)
4. VLAN tagging                      (Disable)

>

Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit                      1 Mngr/s
```

Figure 2-2. Configuring the Manager List

2.2 Connecting IPmux-24 to the Management Station

IPmux-24 can be managed by a network management station (NMS) that is located on the LAN (hub or switch) connected to the one of the unit's Ethernet ports.

➤ **To connect IPmux-24 to the network management station:**

1. Connect a network management station to the LAN (hub or switch).
2. Connect one of IPmux's Ethernet ports to the LAN.

2.3 Launching RADview IPmux-24

The RADview IPmux-24 management application can be opened from the SNMPc Management Console (PC version), HPOV (Unix version), or Network Elements Tree windows. A separate RADview IPmux-24 management window can be opened for each IPmux-24 unit.

Note

In order to launch the Element Manager, you must first ensure that the server is running and start the client. If it is not already in the NMS database, you must also add the IPmux object to the NMS as a managed element. For additional details on launching and using RADview please refer to the RADview-SC/TDMoIP User's Manual.

➤ **To open the IPmux Element Manager from the SNMPc Management Console window (PC version):**

- Double-click the IPmux-24 icon located in the map view.

  The RADview IPmux Element Manager window appears.

➤ **To open the IPmux Element Manager from the EMS HPOV window (Unix version):**

- Select the IPmux-24 icon located in the map view and then click the zoom icon ( ).

  The RADview IPmux Element Manager window appears.

2.4 Using the GUI

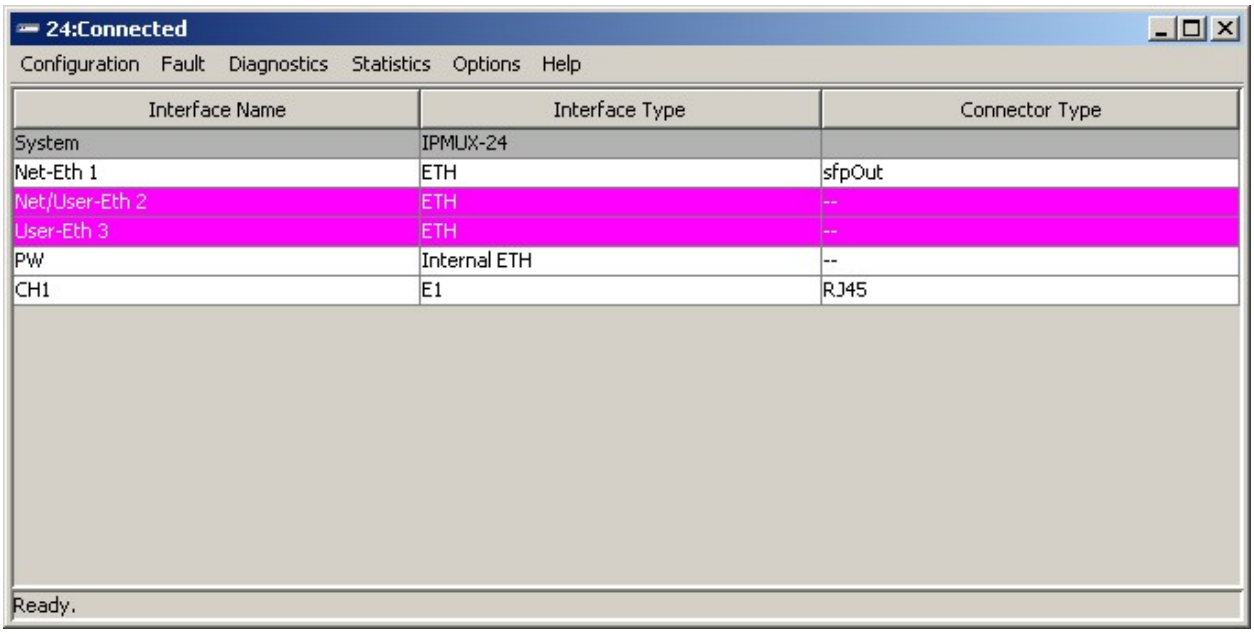

Figure 2-3. Element Manager – IPmux

The RADview IPmux Element Manager window provides a dynamically updated representation of the IPmux-24 network element, allowing you to monitor and manage the IPmux device. The Element Manager window displays the device hardware configuration, represented as a list of rows, showing the existing slots and ports. IPmux is managed by selecting a row and then selecting the desired function from the menus. In many cases, this will open a sub-window or dialog box, allowing further selection and manipulation.

The status of each port is indicated by the background color of its row, according to the following table.

Table 2-1. Element Manager Port Status Colors

Row Color	Status
White/Gray	Normal
Purple	Fail
Blue	Test

Each row in the Element Manager window contains three columns:

- The Object column (Interface Name) represents the system or slot object.
- The Interface Type column represents the type of interface port installed in this slot.
- The Connector Type column represents the type of physical connector on this port.

Selecting the Device or a Port

By selecting a row, you can manipulate or manage the selected system or port. When selected, a light blue frame is displayed around the selected window, and the background color of the selected row is dark gray. Only one row can be selected at a time.

There are two IPmux user interface object levels:

- System (whole device) – contains all of the parameters and functions that are common to the whole device.
- Port – contains all of the parameters and functions of the selected port.

➤ **To select the entire device (system):**

- In the Element Manager window, click the **System** row.

➤ **To select a port:**

- In the Element Manager window, click the row of the desired port.

Status Indicators

At the top of the window, the title bar displays <element name>:<status>, where status is either **Connected** or **Disconnected**, according to the current connectivity of the network element to the NMS.

At the bottom of the Element Manager window, there is also a communications status bar. Sometimes, congestion in the network handling the management traffic causes significant delays during polling, transfer of large data tables, etc. When feasible, a progress bar is used to inform the operator of the ongoing process status. Otherwise, a message is displayed in the status bar at the bottom of the screen, according to the following table.

Table 2-2. Element Manager Status Bar Messages

Message	Status
Working...	Displayed from the moment when a request is sent to the network element (IPmux-24), until data is received or a certain time expires (around 5 seconds).
Waiting...	Displayed while the RADview station waits more than a few seconds for the network element response, but less than the time-out time.
Interrupted	When all attempts to communicate with network element failed (time-out), or when the response was an SNMP error.
Ready	Displayed after the process has been successfully completed.

Common Dialog Buttons

Function buttons, located in a sub-window or dialog box, each initiate the execution of an operation. The most common buttons, and their respective functions, are listed in the following table.

Table 2-3. Common Dialog Buttons

Button	Function
Set	Confirm and activate the selections made in the dialog box and close the box.
Apply	Confirm and activate the selections made in the dialog box without closing the box.
Cancel	Cancel the selections made in the dialog box and close the box.
Close	Close the dialog box without any other effect.
OK	Confirm the message displayed in an information box, and close the box.
Add	Open a new dialog box that is used to add a new item to the list or table displayed in the dialog box.
Change	Open a new dialog box that is used to change an item selected in the list or table displayed in the dialog box.
Delete	Delete a selected item from the list or table displayed in the dialog box.
Refresh	Poll the managed unit to retrieve again the information needed to display the current dialog box. This action updates the displayed information.

System Level Menu Options

The following tables list the RADview tasks that are available on the system level.

Table 2-4. System Management Options

Tasks – Configuration	Dialog Box and Parameter Location	Path
Configuring System Information	System Information dialog box See *Configuring System Information*	Configuration ➥System Info...
Configuring System Parameters	System Parameters dialog box See *Configuring System Parameters*	Configuration ➥System Parameters...
Viewing Bundle Connection Table	Bundle Connection Table See *Configuring Bundles*	Configuration ➥Bundle ➥Bundle ConnectionTable...
Configuring Bridge Parameters	Bridge Parameters dialog box See *Configuring Bridge Parameters*.	Configuration ➥Bridge ➥Parameters...

Tasks – Configuration	Dialog Box and Parameter Location	Path
Viewing Bridge Ports	Bridge Ports Table See *Viewing Bridge Ports*.	Configuration ➥Bridge ➥Ports...
Configuring the MAC Table	MAC Table dialog box See *Configuring the MAC Table*	Configuration ➥Bridge ➥MAC Table...
Configuring VLAN Membership (Egresss)	VLAN Membership (Egress) dialog box See *Configuring VLAN Membership (Egress)*	Configuration ➥Bridge ➥VLAN Membership (Egress)...
Configuring 802.1P Mapping	802.1 Mapping See *802.1P Mapping*.	QoS ➥Mapping ➥802.1P...
Configuring DSCP Mapping	DSCP Mapping See *DSCP Mapping*.	QoS ➥Mapping ➥DSCP...
Configuring TOS Mapping	TOS Mapping See *TOS Mapping*.	QoS ➥Mapping ➥TOS...
Configuring Port Default Priority Mapping	Port Default Priority Mapping See *Port Default Priority Mapping*	QoS ➥Mapping ➥Port Default Priority...
Configuring Quality of Service (Rate Limitation)	Rate Limitation dialog box See *Configuring Quality of Service (Rate Limitation)*	Configuration ➥QoS ➥Rate Limitation...
Configuring Ethernet Ring	Ethernet Ring dialog box See *Configuring Ethernet Ring*.	Configuration ➥ETH Ring...
Deleting LAN tabel	Delete LAN Table dialog box See *Deleting LAN Table*	Configuration ➥System Commands ➥Delete LAN Table
Restoring default configuration	Default Configuration dialog box See *Resetting IPmux-24 to the Default Configuration*	Configuration ➥System Commands ➥Default Configuration
Resetting the IPmux-24 device	Reset Agent dialog box See *Resetting IPmux-24*	Configuration ➥System Commands ➥Reset
Polling the Agent	See *Polling the Agent*	Configuration ➥System Commands ➥Poll Agent
Configuring the System Clocks	System Clocks dialog box See *Configuring the System Clocks*	Configuration ➥Clocks...
Tasks – Fault	Dialog Box and Parameter Location	Path
Viewing active alarms	Active Alarm List	Fault

Tasks – Configuration	Dialog Box and Parameter Location	Path
	See *Viewing Active Alarms*	➥Alarms...
Viewing the history log	System Log Buffer See *Viewing the History Log*	Fault ➥History Log ➥List...
Clearing the history log	See *Clearing the History Log*	Fault ➥History Log ➥Clear
Viewing self test results	Self Test Results dialog box See *Viewing Self Test Results*	Diagnostics ➥Self Test Results...
Tasks – Options	Dialog Box and Parameter Location	Path
Viewing the Host configuration	Host dialog box See *Viewing the Host Configuration.*	Options ➥Host Interface IP List...
Establishing link between IPmux-24 and manager	Manager List dialog box See *Maintaining Manager List*	Options ➥Manager List...
Masking traps	Masking Traps dialog box See *Masking Traps*	Options ➥Masking Traps...
Setting Telnet and Web Access	Access dialog box See *Enabling or Disabling Telnet and Web Access*	Options ➥Access...
Tasks – Statistics	Dialog Box and Parameter Location	Path
Setting polling interval	Polling Interval dialog box See *Setting the Polling Interval*	Statistics ➥Polling Interval...
Viewing bundle statistics	Bundle Statistics dialog box See *Viewing Bundle Statistics*	Statistics ➥Bundle Statistics...

Port Level Menu Options

The following tables list the RADview tasks that are available on the port level.

Table 2-5. Port Level Management Options

Tasks – Configuration	Dialog Box and Parameter Location	Path
Viewing Interface Information (for Ethernet only)	Interface Information dialog box See *Viewing Ethernet Interface Information*	Configuration ➥Interface Info...
Configuring port parameters	Interface Parameters dialog box See *Configuring the E1/T1 Ports*, *Configuring the Ethernet Ports*, *Configuring the Serial Port*, *Configuring the Internet Ethernet Ports.*	Configuration ➥Parameters...
Configuring bundles	Bundle dialog box See *Configuring Bundles*	Configuration ➥Bundles...

Tasks – Diagnostics	Dialog Box and Parameter Location	Path
Initiate a loopback	Loopback State dialog box See *Performing a Loopback Test*	Diagnostics ➥Loopback...
Tasks – Statistics	**Dialog Box and Parameter Location**	**Path**
Ethernet Interface		
Viewing Ethernet interface statistics (only for Ethernet)	Interface Statistics dialog box See *Viewing Ethernet Port Statistics*	Statistics ➥Interface Statistics...
E1/T1 Interface		
Viewing current statistics	Port Current Statistics dialog box See *Viewing Current Statistics*	Statistics ➥Current...
Viewing intervals statistics	Port Intervals Statistics dialog box See *Viewing Intervals Statisitics*	Statistics ➥Intervals ...

Chapter 3

Configuration Management

This chapter describes how to configure IPmux-24 on all levels, including system and port, and contains the following sections:

- *Setting the System Parameters*
  - *Configuring System Parameters*
  - *Configuring System Information*
  - *Maintaining the Manager List*
  - *Viewing the Host*
  - *Configuring the System Clocks*
  - *Configuring Bridge Parameters*
  - *Viewing Bridge Ports*
  - *Configuring the MAC Table*
  - *Configuring the Static MAC Table*
  - *Configuring VLAN Membership (Egress)*
  - *Configuring VLAN Parameters*
  - *Configuring QoS Classification*
  - *Configuring QOS Mapping*
  - *Configuring Quality of Service (Rate Limitation)*
- *Setting the Operational Parameters*
  - *Configuring IPmux-24 Ports at the Physical Layer*
  - *Configuring the E1/T1 Ports*
  - *Configuring the Ethernet Ports*
  - *Configuring the Internal Ethernet Ports*
  - *Assigning Timeslots to Bundles*
  - *Managing Bundle Connections*
- *Additional Tasks*
  - *Displaying Ethernet Interface Information*
  - *Displaying Ethernet SFP Information*
  - *Displaying Ethernet Optical SFP Information*
  - *Resetting IPmux-24 to the Default Configuration*

- *Polling the Agent*
- *Resetting IPmux-24*

3.1 Setting the System Parameters

Configuring System Parameters

The **System Parameters** command enables you to view and set major system parameters for the IPmux-24 device. You can configure parameters such as the Default Gateway, DHCP Client Mode, Aging Time, and Transmit Clock Source, and the External Clock User Quality.

➤ **To set system parameters for the selected IPmux device:**

1. Select **Configuration > System Parameters...**.

   The System Parameters dialog box appears (see *Figure 3-1*). System Parameters differ, depending on the different port combinations. *Table 3-1* describes the different system parameters.

2. Configure the desired parameters.
3. Click ‹**Set**› to implement the changes.

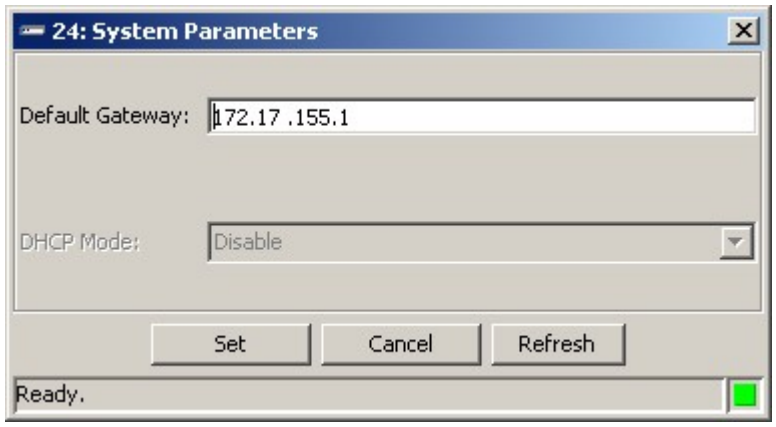

Figure 3-1. System Parameters Dialog Box

Table 3-1. System Parameters

Parameter	Possible Values / Remarks
Default Gateway	**IP Address**
DHCP Mode	DHCP Client Mode **Enabled -** Enables DHCP Client action for IPmux-24 **Disabled -** Disables DHCP Client action for IPmux-24 Default: **Enabled**
Aging Time (sec.)	Aging Time, in seconds **Checked**, **Unchecked** **0..4080** Default: **300** ***Note:*** *When the checkbox is checked, the Aging Time parameter is enabled and its value can be changed.*
Transmit Clock Source	The source of the transmit clock **Internal** - Local clock source is used **External** - Recovered from the other interface network and used for data transmission on this interface **Loopback** - Transmit clock recovered from received data **Adaptive** - Adaptive clock regeneration ***Note:*** *Field is disabled if an activate circuit is connected.*
External Clock User Quality	Allows the user to mark the quality level of the clock **ST1** - Stratum-1 PRC (Primary Reference Clock) Rec. G.811 (0x10) **ST2** - Stratum-2 SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit (0x70) **ST3** - Stratum-3 SSU-L (Sync. Source Unit Local) Rec. G.812 Local (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) Default: **ST1** The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Configuring System Information

The **System Info** command enables you to view and set system information for the IPmux-24 device. This information is useful for identifying multiple IPmux-24 units and for tracking their locations and administrative contacts. You can also use the System Information dialog box for setting the system Date and Time and for viewing the DHCP client status.

➤ **To set system information for the selected IPmux device:**

1. Select **Configuration** › **System Info...**.

   The System Information dialog box appears (see *Figure 3-2*).

2. Enter the required settings as described in *Table 3-2*.
3. Click ‹**Set**› to implement the changes.

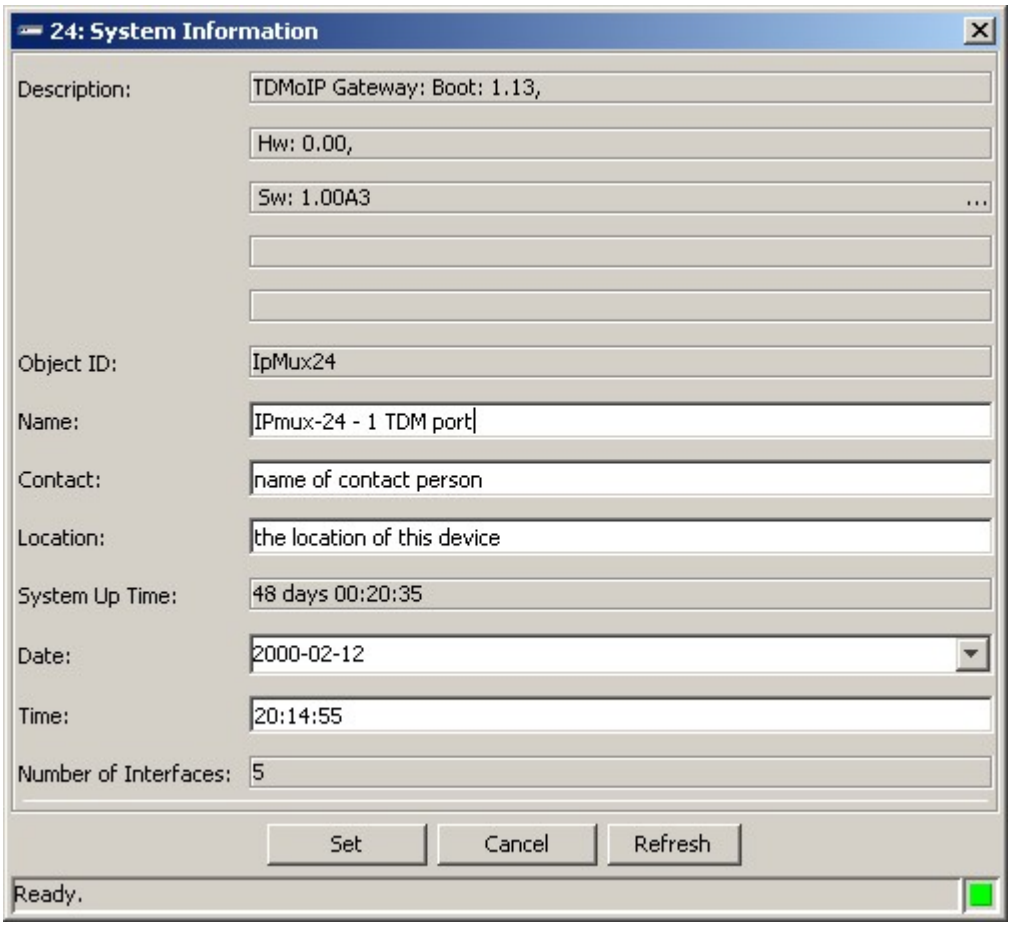

Figure 3-2. System Information Dialog Box

Table 3-2. System Information Parameters

Parameter	Possible Values / Remarks
Description	Description of the system
Object ID	Object ID
Name	System name
Contact	System contact
Location	System location
System Up Time	System up time
Date	System date
Time	System time
Number of Interfaces	Number of interfaces on the system Read only
DHCP Status	
Server ID	DHCP Server IP address Read only
Lease Expiration Time	The time left, in minutes, until lease expiration
Status	DHCP Status
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Maintaining the Manager List

In order to remotely configure IPmux-24, the IP address of the NMS must be listed in the Manager List. The **Manager List** command enables you to display and configure the Manager List, where you designate the destination NMS stations for SNMP traps.

The Manager list has 10 static entries for 10 Managers.

➤ **To display the manager list:**

- Select **Options > Manager List...**.

  The Manager List appears.

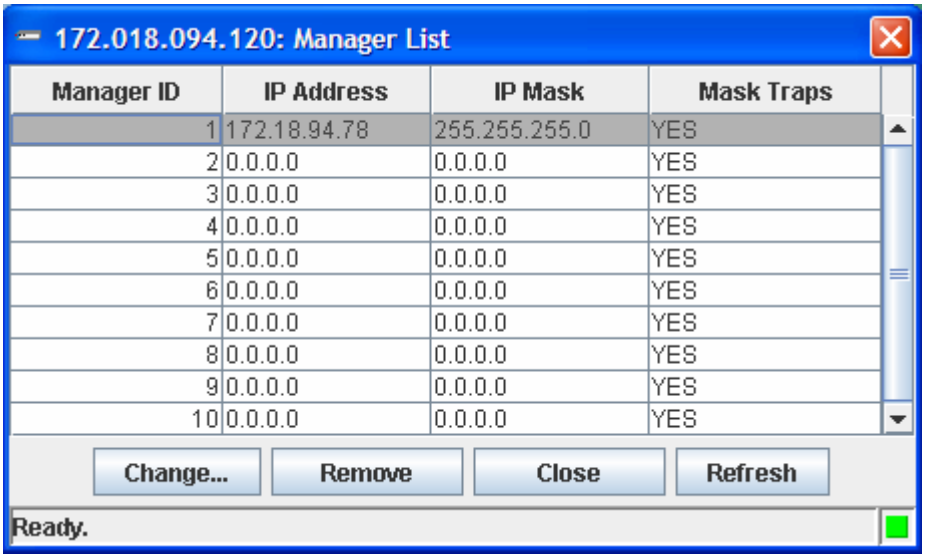

Figure 3-3. Manager List Dialog Box

Note *An entry where IP Address = 0.0.0.0 is considered "no manager" entry. To add an entry, see Changing an Entry in the Managers List.*

Table 3-3. Manager List Parameters

Parameter	Possible Values/Remarks
Manager ID	The Manager List ID.
IP Address	IP address of the Network Management System
IP Mask	The IP Mask.
Mask Traps	Indicates whether or not traps are masked by the system. **Yes, No**
[Change...]	Click to change an entry in the Managers List
[Remove]	Click to remove an entry from the Manages List
[Close]	Click to apply the Managers List parameters and close the dialog box
[Refresh]	Click to refresh the information in the window.

Changing an Entry in the Managers List

➤ **To change an entry in the Manager List:**

1. Select an entry in the **Manager List** and click ‹**Change...**›

   The Change Manager dialog box appears (*Figure 3-4*).

2. Change the desired parameters. The Change Manager parameters are the same as the parameters for the Manager Table (see *Table 3-3*).

3. Click ‹**Set**› to implement the changes.

   A message appears, warning about possible disconnection of the manager.

4. Click ‹**OK**› to continue.

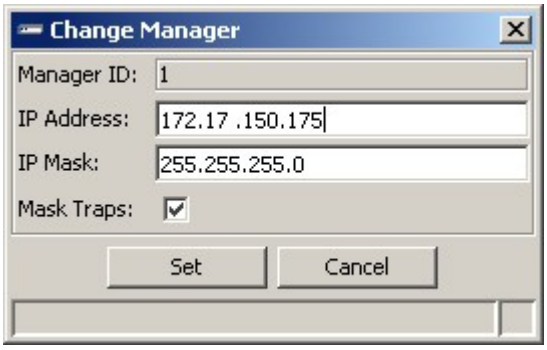

Figure 3-4. Change Manager Dialog Box

Removing an Entry from the Managers List

➤ **To remove an entry from the Manager List:**

1. Select a row from the **Manager List** (*Figure 3-3*) and click ‹**Remove**›.

   A message appears, warning about possible disconnection of the manager.

2. Click ‹**OK**›.

Viewing the Host

➤ **To view the host:**

- Select **Options > Host Interface IP List...**.

  The Host Interface IP List dialog box appears (see *Figure 3-5*). The parameters are described in *Table 3-4*.

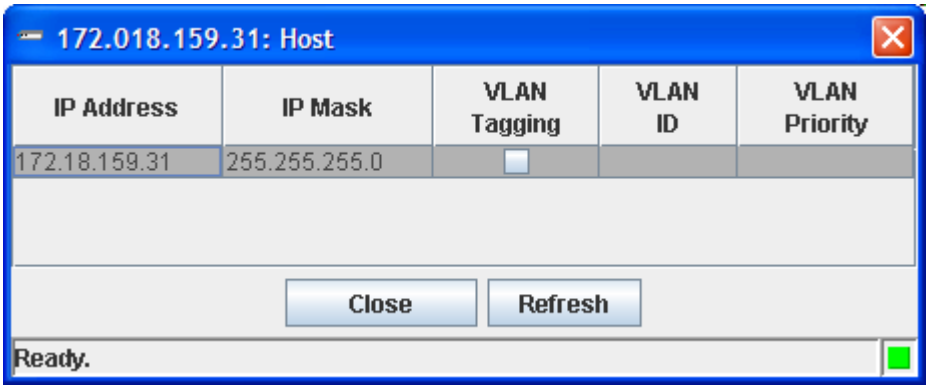

Figure 3-5. Host Dialog Box

Table 3-4. Host Interface IP List Parameters

Parameter	Possible Values / Remarks
IP Address	Host IP Read only
VLAN Tagging	VLAN Tagging **No, Yes** ***Note:*** *If VLAN Tagging =* ***Yes****, the VLAN ID and VLAN Priority values will be used for the bundles.*
VLAN ID	Host VLAN ID **1...4095**
VLAN Priority	Host VLAN frame priority. **0..7**
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Configuring the System Clocks

The **System Clocks** command enables you to configure the Master and Fallback clocks that keep the IPmux-24 communications lines synchronized with external devices. You can also use this command to mark the Clock Quality (Stratum) Level.

➤ **To configure the system clocks:**

1. Select **Configuration > Clocks...**.
2. The System Clocks Dialog Box appears (see *Figure 3-6*).
3. Configure the desired parameters as described in *Table 3-5,* and click ‹**Set**›.

Note

Master and Fallback clocks cannot be set to the same port.

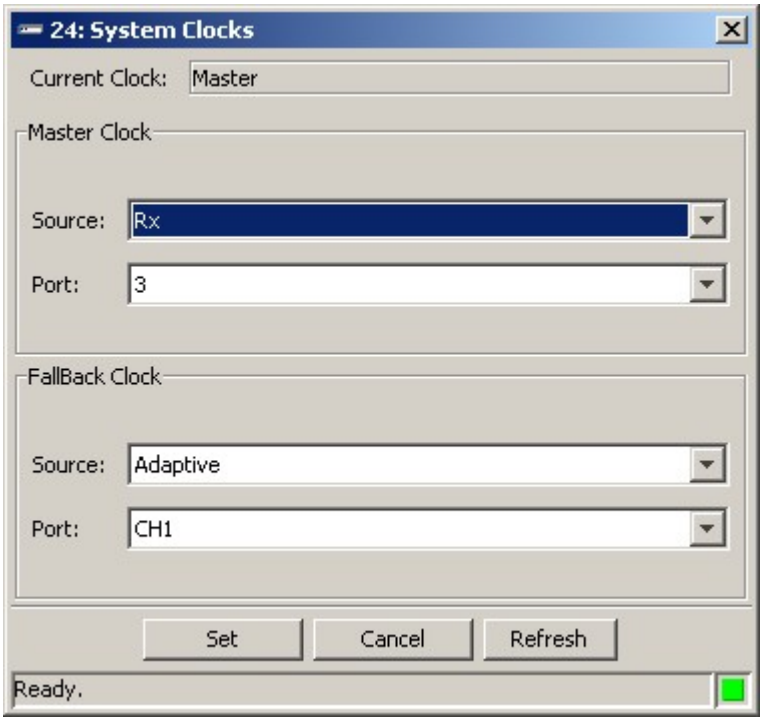

Figure 3-6. System Clocks Dialog Box

Table 3-5. System Clocks Parameters

Parameter	Possible Values / Remarks
Current Clock	Indicates the current source of the system clock (read only). **Master** **Fallback**
Master Clock	
Source	**Adaptive** **Internal** **Rx**
Port	**Station (External)** **Port 1**
Fallback Clock	
Source	**Adaptive** **Internal** **Rx**
Port	**Station (External)** **Port 1**
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Configuring Bridge Parameters

➤ **To configure bridge parameters:**

1. Select **Configuration > Bridge > Parameters...**.

   The Bridge Parameters Table appears (see *Figure 3-7*).

2. Configure the desired parameters as described in *Table 3-6*.
3. Click <**Set**>.

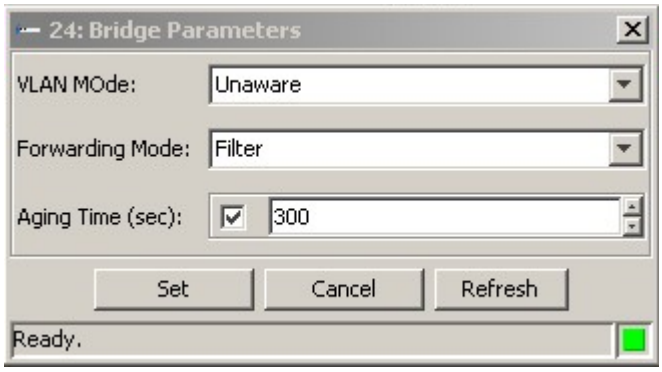

Figure 3-7. Bridge Parameters Dialog Box

Table 3-6. Bridge Parameters

Parameter	Possible Values / Remarks
VLAN Mode	**Aware**, **Unaware** Default: **Unaware** *Note: When chaning the VLAN Mode, the following message appers: "Changing VLAN Mode may disconnect the Agent"*
Forwarding Mode	Bridge forwarding mode **Filter** – filter frames received according to MAC Address **Transparent** – forward all frames received (not dependent on VLAN) Default: **Filter**
Aging Time (sec.)	Aging Time, in seconds **Checked**, **Unchecked** **0..4080** Default: **300** ***Note:*** *When the checkbox is checked, the Aging Time parameter is enabled and its value can be changed.*
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Viewing Bridge Ports

➤ **To view bridge ports:**

1. Select **Configuration > Bridge > Ports...**.

   The Bridge Ports Table appears (see *Figure 3-8*).

2. Configure the desired parameters as described in *Table 3-7*.
3. Click <**Close**>.

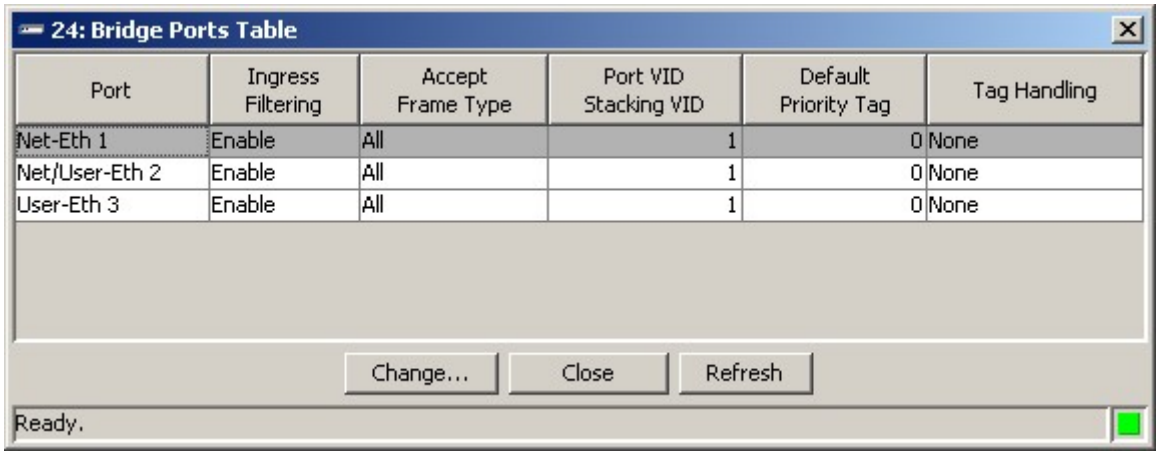

Figure 3-8. Bridge Ports Table

Table 3-7. Bridge Port Parameters

Parameter	Possible Values / Remarks
Port	The selected port. Read only
Ingress Filtering	**Enable**, **Disable** Read only
Accept Frame Type	**All**, **Tag Only** Read only
Port VID/Stacking VID	**1..4094** Default: **1**
Default Priority Tag	Default frame priority of the VLAN added by the port. **0..7** Read only
Tag Handling	Indicates how the Ingress VLAN Tag is processed. **None**, **Stacking** Read only ***Note:*** *This field only exists when Bridge* ***VLAN Mode = Unaware*** *and is only enabled for USER ports.*
[Change...]	Click to change the parameters of the Bridge Port.
[Close]	Click to apply the settings and close the window.

Parameter	Possible Values / Remarks
[Refresh]	Click to refresh the information in the window.

Changing Bridge Port Parameters

➤ **To change bridge port parameters:**

1. From the Bridge Ports Table just described, select a row.
2. Click <**Change...**>.

   The Change Bridge Port Table appears (see *Figure 3-9*).
3. Configure the desired parameters. The Change Bridge Port parameters are the same as the parameters for the Bridge Port Table (see *Table 3-7).*
4. Click <**Set**>.

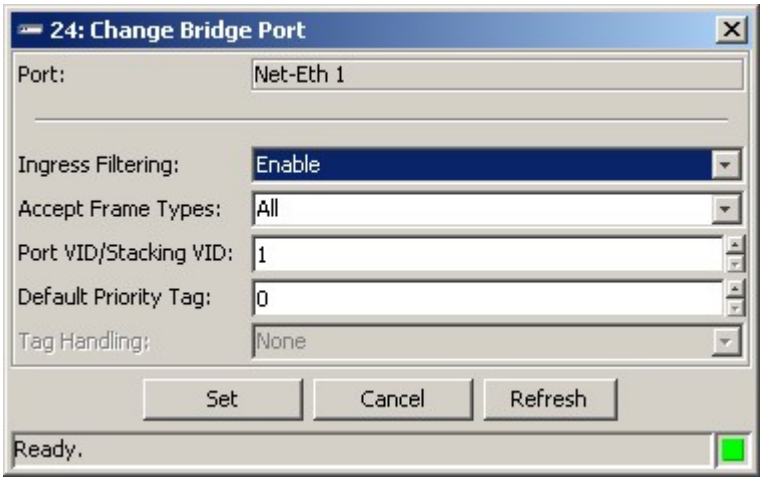

Figure 3-9. Change Bridge Port Dialog Box

Configuring the MAC Table

The **Mac Table** command enables you to manually configure Virtual (VLAN) Bridged Local Area Networks, port-based VLANs (per IEEE 802.1Q), where VLAN membership of a data frame is determined based upon the bridge port on which the frame is received and the frame's destination MAC address. The mappings of Received Bridge Ports and destination MAC Addresses to VLAN IDs are stored in the MAC Table.

➤ **To configure the MAC Table:**

1. Select **Configuration > Bridge > MAC Table...**.

   The MAC Table dialog box appears (see *Figure 3-10*).
2. To sort the information in the MAC Table, click on the column you wish to sort it by.
3. Configure the desired parameters as described in *Table 3-8*.
4. Click <**Close**>.

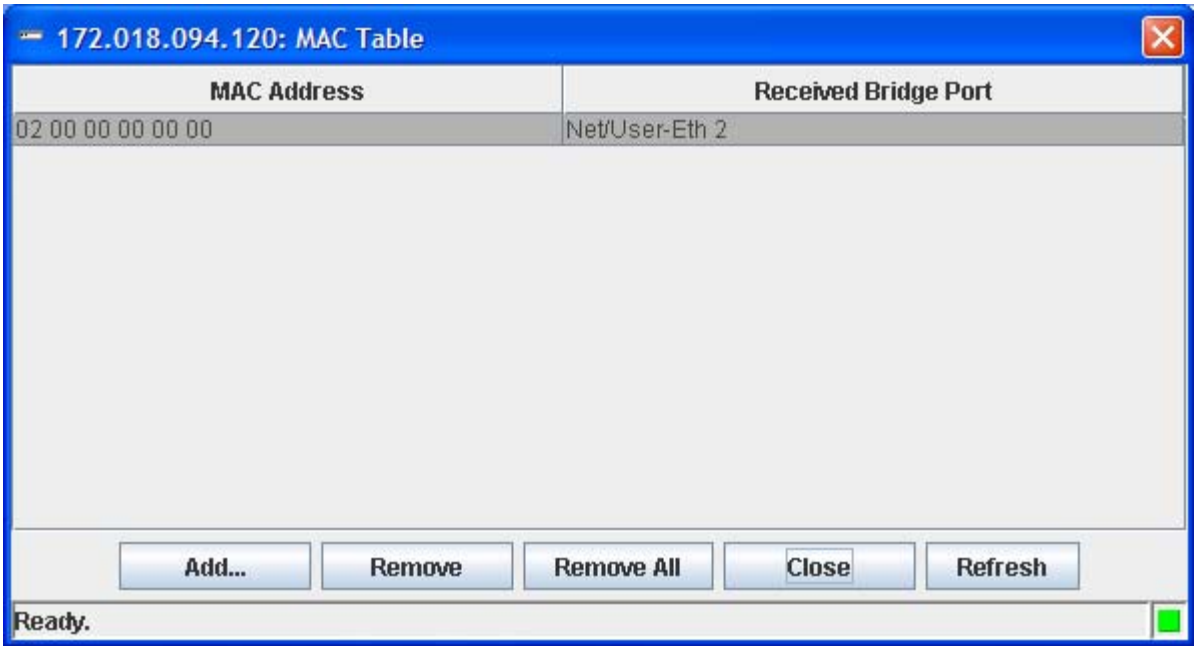

Figure 3-10. MAC Table Dialog Box

Table 3-8. MAC Table Parameters

Parameter	Possible Values / Remarks
VLAN ID	**1...4094** **Read only** ***Note:*** *This parameter appears when VLAN Mode = Aware.*
MAC Address	The destination MAC address in a frame to which this entry's filtering information applies ***Note:*** *The second nibble in the MAC Address must be an even number.* Read only
Received Bridge Port	The port number of the port from which a frame must be received in order for this entry's filtering information to apply **NET–ETH 1** **NET/USER–ETH 2** **USER–ETH 3** Read only
Status	**Learned** **Static** Read only
[Add...]	Click to add a new entry to the table.
[Remove]	Click to remove an entry from the table.
[Remove All]	Click to delete the table.
[Next]	Click to display the next 500 entries.
[Close]	Click to apply Static MAC Table parameters and close the window.

Parameter	Possible Values / Remarks
[Refresh]	Click to refresh the information in the window

Adding a New Entry

➤ To add a new entry:

1. From the MAC Table just described, click ‹Add...›.

   The MAC Table: Add Entry dialog box appears (see *Figure 3-11, Figure 3-15).*

2. Configure the desired parameters. The Add Entry parameters are the same as the parameters for the Mac Table (see *Table 3-8, Table 3-9*).

3. Click ‹Apply›.

   The new entry is added to the table.

4. Click ‹Close›.

   The Add Entry dialog closes and the Static MAC Table dialog box displays the updated table.

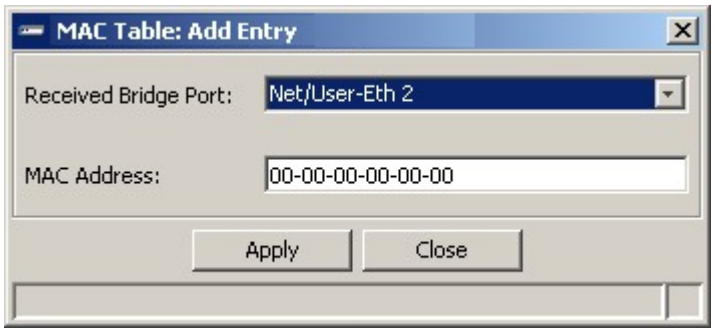

Figure 3-11. MAC Table: Add Entry Dialog Box

Removing a Static Entry from the MAC Table

➤ To remove a static entry:

1. From the MAC Table just described, select one or multiple static row(s) you wish to remove from the table.

2. Click ‹Remove›.

   A confirmation message appears.

Figure 3-12. Removing a Static Entry Confirmation Box

3. Click ‹OK›.

   The static entries are removed from the table.

Deleting the MAC Table

➤ **To delete the MAC Table:**

1. From the MAC Table just described, click <**Remove All**>.

   A confirmation message appears.

Figure 3-13. Remove All Confirmation Box

2. Click <**OK**>.

   All of the entries are removed from the table.

Configuring the Static MAC Table

The **Mac Table** command enables you to manually configure Virtual (VLAN) Bridged Local Area Networks, port-based VLANs (per IEEE 802.1Q), where VLAN membership of a data frame is determined based upon the bridge port on which the frame is received and the frame's destination MAC address. The mappings of Received Bridge Ports and destination MAC Addresses to VLAN IDs are stored in the Static MAC Table.

➤ **To configure the MAC table:**

1. Select **Configuration > MAC Table...**.

   The Static MAC Table dialog box appears (see *Figure 3-14*).

2. To sort the information in the Static MAC Table, click on the column you wish to sort it by.
3. Configure the desired parameters as described in *Table 3-9*.
4. Click <**Close**>.

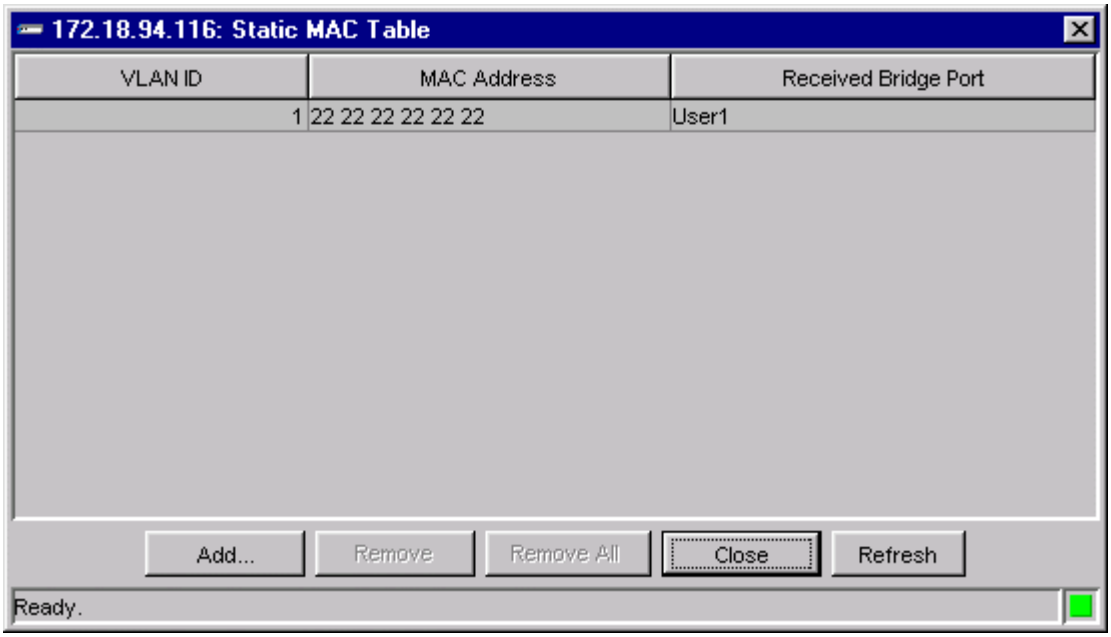

Figure 3-14. Static MAC Table Dialog Box

Table 3-9. Static MAC Table Parameters

Parameter	Possible Values / Remarks
VLAN ID	1..4094
MAC Address	The destination MAC address in a frame to which this entry's filtering information applies
Received Bridge Port	The port number of the port from which a frame must be received in order for this entry's filtering information to apply User1 User2 Network
[Add...]	Click to add a new entry to the table.
[Remove]	Click to remove an entry from the table.
[Remove All]	Click to remove all entries from the table.

Adding a New Entry to the Static MAC Table

➤ To add a new entry:

1. Click <Add>.

   The Static MAC Table: Add Entry dialog box appears (see *Figure 3-15*).

2. Configure the desired parameters. The Add Entry parameters are the same as the parameters for the Static Mac Table (see *Table 3-9*).

3. Click <Apply>.

   The new entry is added to the table.

4. Click <Close>.

   The Add Entry dialog closes and the Static MAC Table dialog box displays the updated table.

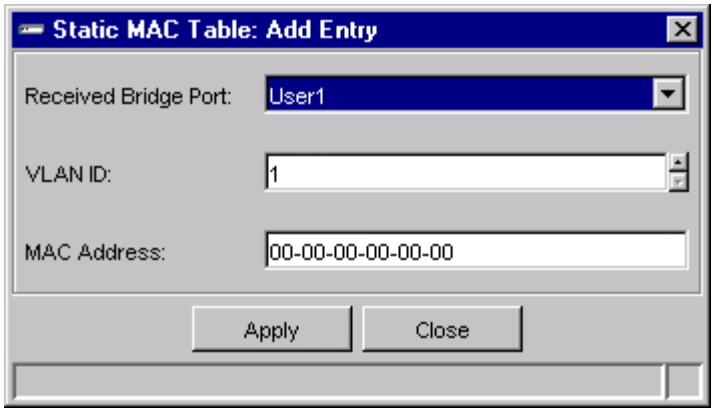

Figure 3-15. Static MAC Table: Add Entry Dialog Box

Removing an Entry from the Static MAC Table

➤ To remove an entry from the Static MAC table:

1. Select the rows of entries you wish to remove from the table.

2. Click <Remove>.

   A confirmation message appears.

3. Click <OK>.

   The entries are removed from the table.

Removing all Entries from the Static MAC Table

➤ To remove all entries from the Static MAC Table:

1. Click <Remove All>.

   A confirmation message appears.

2. Click <OK>.

   All of the entries are removed from the table.

Configuring VLAN Membership (Egress)

The **VLAN Membership (Egress) Configuration** command enables you to configure the list of virtual LANs (VLANs) for IPmux-24. A VLAN is a logical (virtual) network of devices that behave as if they are on the same physical LAN segment, even if they are physically connected to different network segments. In addition, multiple VLANs can co-exist on the same switching hardware, providing a form of logical network segmentation.

Note *VLAN Membership (Egress) is only enabled when VLAN Mode =* ***Aware.***

➤ **To view VLAN Membership (Egress):**

1. Select **Configuration > Bridge > VLAN Membership (Egress)....**

   The VLAN Membership (Egress) Table appears (see *Figure 3-16*).

2. Configure the desired parameters as described in *Table 3-10*.
3. Click <**Close**>.

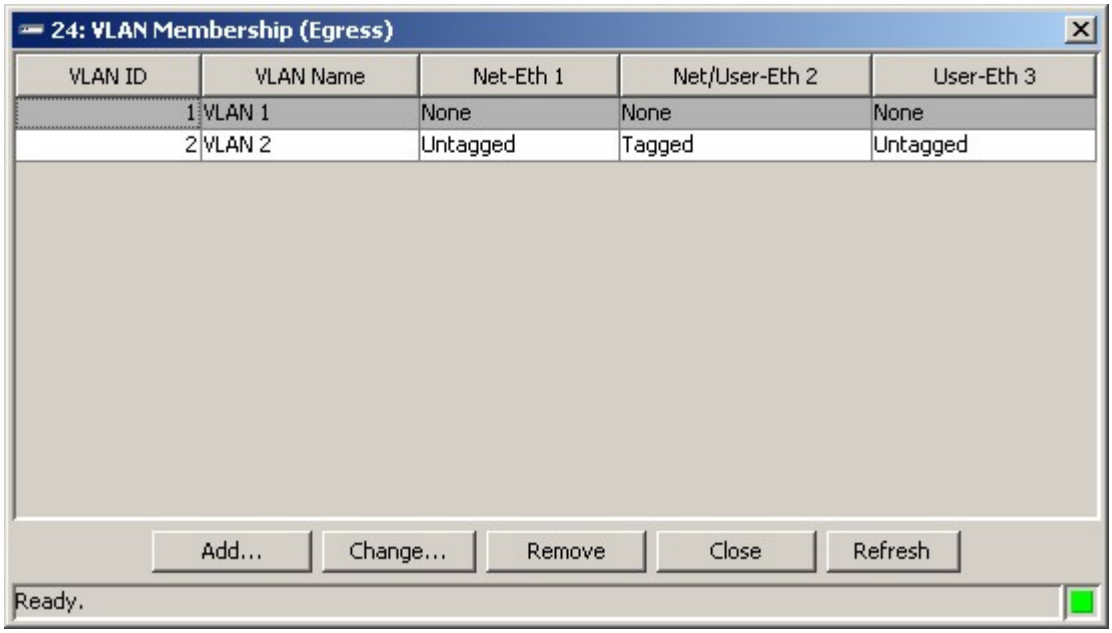

Figure 3-16. VLAN Membership (Egress) Table

Table 3-10. VLAN Membership (Egress) Parameters

Parameter	Possible Values / Remarks
VLAN ID	The VLAN ID **1...4094** Read only
VLAN Name	The name of the VLAN name. Read only
NET-ETH 1	**Tagged, Untagged, None** Read only

Parameter	Possible Values / Remarks
NET/USER-ETH 2	**Tagged, Untagged, None** Read only
USER-ETH3	**Tagged, Untagged, None** Read only
[Add...]	Click to add a new VLAN Membership (Egress).
[Change...]	Click to change the parameters of a VLAN Membership (Egress).
[Remove]	Click to remove a VLAN Membership (Egress).
[Close]	Click to apply changes and close the window,
[Refresh]	Click to refresh the information in the window.

Adding a VLAN Membership (Egress)

➤ **To add a VLAN Membership (Egress):**

1. From the VLAN Membership (Egress) Table just described, click ‹**Add...**›.

   The Add VLAN Membership (Egress) dialog appears (see *Figure 3-17*).

2. Configure the desired parameters. The Add VLAN Membership (Egress) parameters are the same as the parameters for the VLAN Membership (Egress) Table (see *Table 3-10*).

3. Click ‹**Apply**›.

   The new VLAN Membership (Egress) is added to the table.

4. Click ‹Close›.

   The VLAN Membership (Egress) dialog closes.

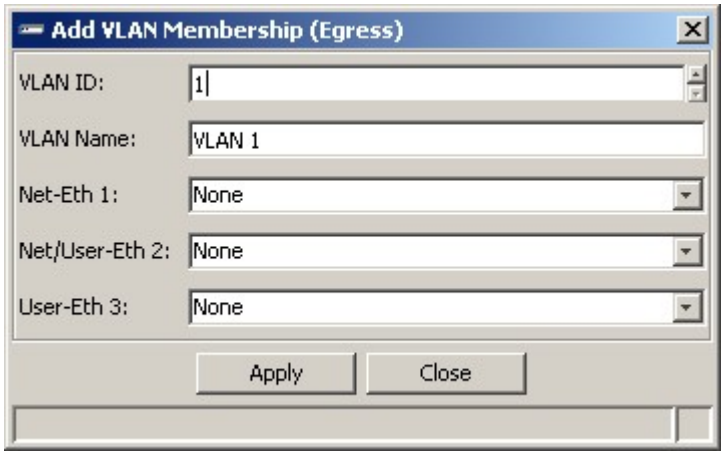

Figure 3-17. Add VLAN Membership (Egress) Dialog Box

Note *The number of VLANs cannot exceed 64.*

Changing a VLAN Membership (Egress)

➤ **To change a VLAN Membership (Egress):**

1. From the VLAN Membership (Egress) Table just described, select the row you wish to change and click <**Change...**>.

   The Change VLAN Membership (Egress) dialog appears (see *Figure 3-18*).

2. Configure the desired parameters. The Change VLAN Membership (Egress) parameters are the same as the parameters for the VLAN Membership (Egress) Table (see *Table 3-10*).

3. Click **Apply**.

   The VLAN Membership (Egress) is changed.

4. Click **Close**.

   The VLAN Membership (Egress) dialog closes.

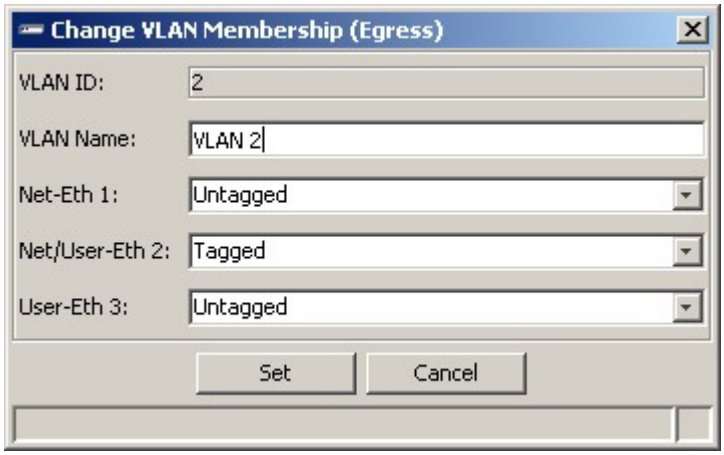

Figure 3-18. Change VLAN Membership (Egress) Dialog Box

Removing a VLAN Membership (Egress)

➤ **To remove a VLAN Membership (Egress):**

1. Select a VLAN Membership (Egress) in the VLAN Membership (Egress) Table.
2. Click <**Remove**>.

   The selected VLAN Membership (Egress) is removed from the table.

Configuring VLAN Parameters

The **VLAN Configuration** command enables you to configure the list of virtual LANs (VLANs). A VLAN is a logical (virtual) network of devices that behave as if they are on the same physical LAN segment, even if they are physically connected to different network segments. In addition, multiple VLANs can co-exist on the same switching hardware, providing a form of logical network segmentation.

➤ **To configure VLAN parameters:**

1. Select **Configuration > VLAN Configuration...**.

   The VLAN Configuration dialog box appears.

2. Configure the desired parameters as described in *Table 3-11*.
3. Click <**Close**>.

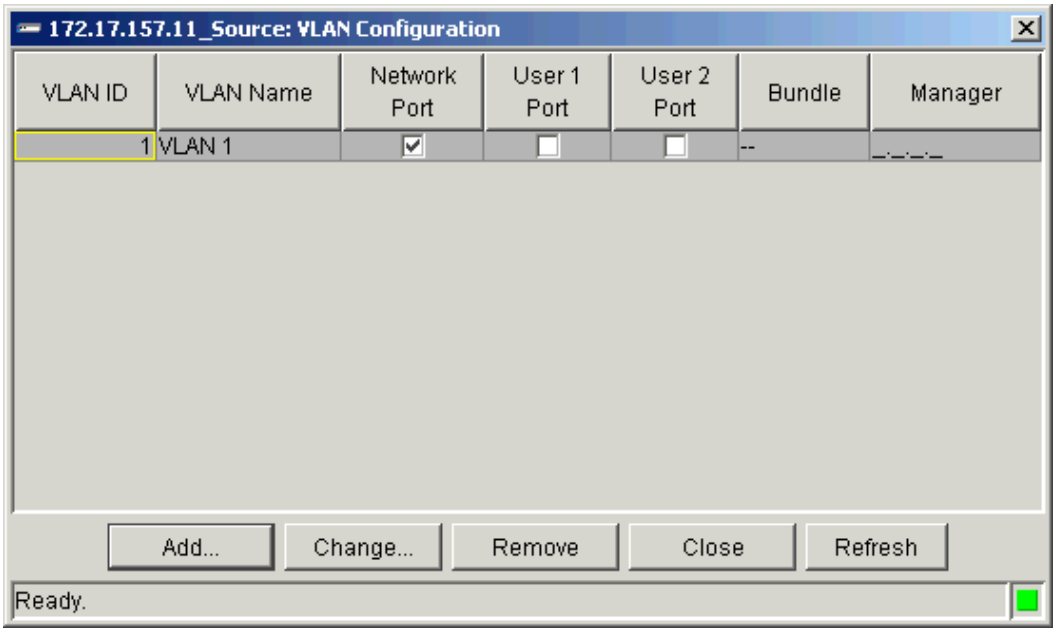

Figure 3-19. VLAN Configuration Dialog Box

Table 3-11. VLAN Configuration Parameters

Parameter	Possible Values / Remarks
VLAN ID	1..4094
VLAN Name	The name of the VLAN
Network Port	Yes, No
Bundle	No, Yes
Manager	No IP Address
[Add...]	Click to add a new VLAN.
[Change...]	Click to change the parameters of a VLAN.
[Remove]	Click to remove a VLAN.
[Close]	Click to apply the VLAN parameters and close the dialog box.
[Refresh]	Click to refresh the information in the dialog box.

Adding a VLAN

➤ To add a new VLAN:

1. In the VLAN Configuration dialog box just described, click [**Add...**].

   The Add VLAN dialog appears (see *Figure 3-20*).

2. Configure the desired parameters. The Add VLAN parameters are the same as the parameters for the VLAN Configuration Table (see *Table 3-11*).

3. Click **Set**.

   The VLAN is added and the screen is refreshed.

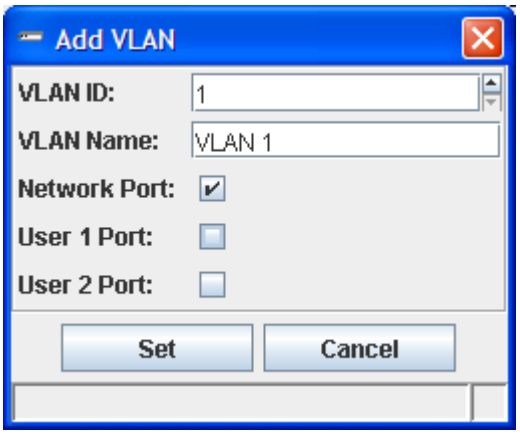

Figure 3-20. Add VLAN Dialog Box

Note

- *The **Add** button will be disabled if there are already 16 VLANs in the table.*
- *The VLAN ID must be different from any already in the table.*

Changing VLAN Parameters

➤ **To change VLAN Parameters:**

1. In the VLAN Configuration dialog box just described, click the row of a VLAN, to select it.
2. Click **<Change...>**.

   The Change VLAN dialog appears (see *Figure 3-21*).
3. Configure the desired parameters. The Change VLAN parameters are the same as the parameters for the VLAN Configuration Table (see *Table 3-11*).
4. Click **<Set>**.

   The VLAN parameters are changed.

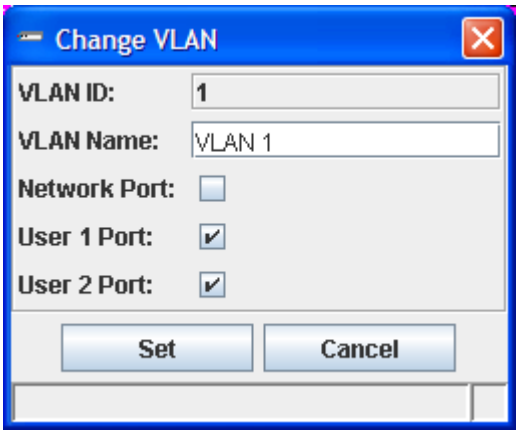

Figure 3-21. Change VLAN Dialog Box

Removing a VLAN

➤ **To remove a VLAN:**

1. In the VLAN Configuration dialog box just described, click the row of a VLAN to select it.
2. Click ‹**Remove**›.

   A warning message appears: "Removing VLAN may disconnect the Agent for 30 seconds".
3. Click ‹**OK**›.

   The VLAN is removed.

Note

*The **Remove** button is only enabled for disconnected VLANs; if the selected VLAN is used by a bundle or a Manager, then the **Remove** button will be disabled.*

Configuring QoS Classification

➤ **To configure QoS classification:**

1. Select **Configuration › QoS › Classification**.

   The QoS Classification dialog box appears (see *Figure 3-22*).
2. For each of the bridge ports, select the QoS classification, as described in *Table 3-12*.
3. Click ‹**Set**›.

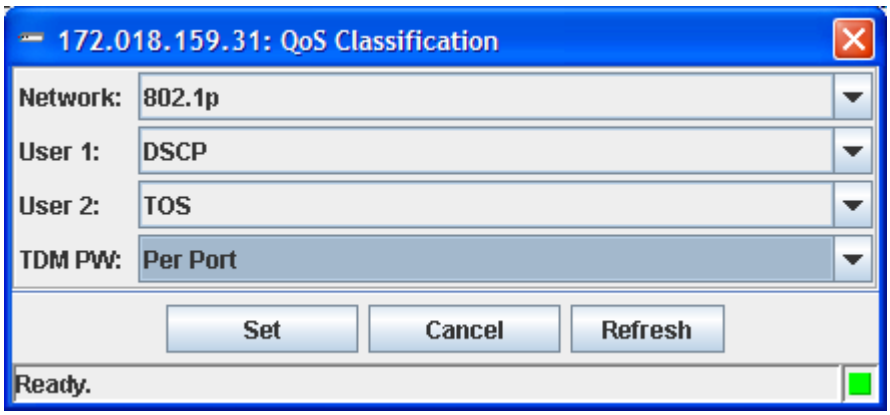

Figure 3-22. QoS Classification Dialog Box

Table 3-12. QoS Classification Parameters

Parameter	Possible Values / Remarks
Network	802.1p, DSCP, TOS, Per Port
User 1	802.1p, DSCP, TOS, Per Port
User 2	802.1p, DSCP, TOS, Per Port
TDM PW	802.1p, DSCP, TOS, Per Port
[Set]	Click to set and save the information.

Parameter	Possible Values / Remarks
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Configuring QOS Mapping

802.1P Mapping

➤ **To configure 802.1P mapping:**

1. Select **Configuration > QoS > Mapping > 802.1P...**.

   The 802.1P Mapping dialog box appears (see *Figure 3-23*).

2. Select one or multiple cells (see *Table 3-13* for a description of the parameters).

3. Click **<Set>.**

Figure 3-23. 802.1p Mapping

Table 3-13. 802.1P Mapping Parameters

Parameter	Possible Values / Remarks
1- User Priority	**0...7** (cells titles) Read only
2-:Traffic Class	**0...3** Read only
[Set]	Click to set and save the information.
[Traffic Class>]	Click to update the Traffic Class.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Updating the Traffic Class

➤ **To update the Traffic Class:**

1. In the 802.1P dialog just described, select one or multiple cells.
2. Click **<Traffic Class>**.

   A submenu appears (see *Figure 3-24*), displaying available Traffic Class values.
3. Select a Traffic Class value.

   The submenu closes.
4. Click **<Set>**.

   The Traffic Class value is updated.

Figure 3-24. Updating Traffic Class Menu

DSCP Mapping

➤ **To configure DSCP mapping:**

1. Select **Configuration > QoS > Mapping > DSCP...**.

   The DSCP Mapping dialog box appears (see *Figure 3-25*).
2. Select one or multiple cells (see *Table 3-14* for a description of the parameters).
3. Click **<Set>.**

Figure 3-25. DSCP Mapping

Table 3-14. DSCP Mapping Parameters

Parameter	Possible Values / Remarks
1- User Priority	DSCP value of the incoming IP packet. **0...63** (cells titles) Read only
2-:Traffic Class	The regenerated priority level the incoming DSCP value is mapped to. **0...3** Read only
[Set]	Click to set and save the information.
[Traffic Class›]	Click to update the Traffic Class.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Updating the Traffic Class

➤ **To update the Traffic Class**

1. In the DSCP dialog just described, select one or multiple cells.
2. Click **‹Traffic Class›**.

   A submenu appears (see *Figure 3-26*), displaying available Traffic Class values.
3. Select a Traffic Class value.

   The submenu closes
4. Click ‹Set›.

   The Traffic Class value is updated.

Figure 3-26. Updating Traffic Class Menu

ToS Mapping

➤ **To configure ToS mapping:**

1. Select **Configuration > QoS > TOS...**.

   The TOS Mapping dialog box appears (see *Figure 3-27*).

2. Select one or multiple cells (see *Table 3-15* for a description of the parameters).
3. Click **<Set>**.

Figure 3-27. TOS Mapping

Table 3-15. TOS Mapping Parameters

Parameter	Possible Values / Remarks
1- User Priority	DSCP value of the incoming IP packet. **0...7** (cells titles) Read only
2-:Traffic Class	The regenerated priority level the incoming DSCP value is mapped to. **0...3** Read only
[Set]	Click to set and save the information.
[Traffic Class>]	Click to update the Traffic Class.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Updating the Traffic Class

➤ **To update the Traffic Class:**

1. In the TOS dialog just described, select one or multiple cells.
2. Click **<Traffic Class>**.

   A submenu appears (see *Figure 3-28*), displaying available Traffic Class values.

3. Select a Traffic Class value.

   The submenu closes

4. Click **<Set>**.

   The cell or cells Traffic Class value is updated.

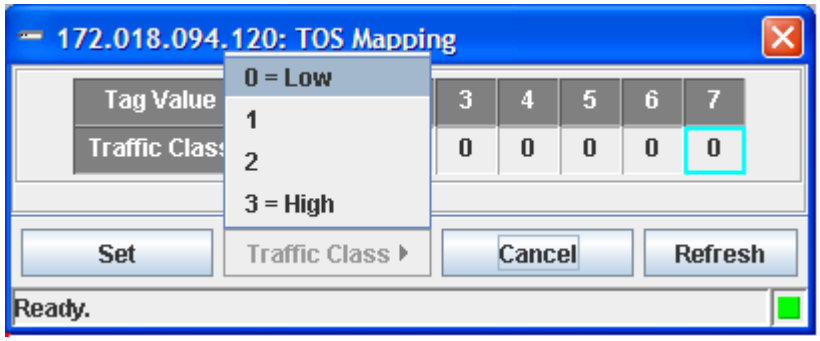

Figure 3-28. Updating Traffic Class Menu

Port Default Priority Mapping

➤ **To configure Port Default Priority mapping:**

1. Select **Configuration > QoS > Port Default Priority...**.

   The Port Default Priority Mapping dialog box appears (see *Figure 3-29*).

2. Select one or multiple cells (see *Table 3-16* for a description of the parameters).

3. Click **<Close>**.

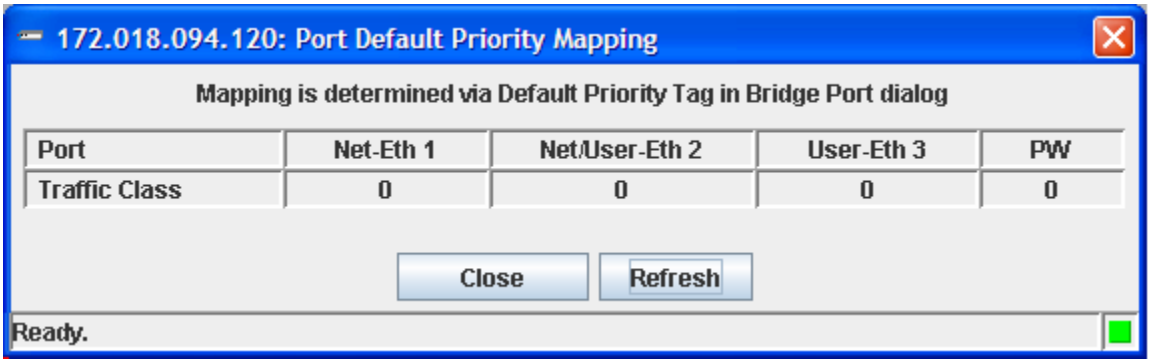

Figure 3-29. Port Default Priority Mapping

Table 3-16. Port Default Priority Mapping Parameters

Parameter	Possible Values / Remarks
1- User Priority	A unique port index. **0...7** (cells titles) Read only
2-:Traffic Class	The Traffic Class level of this port. **0...3** Read only
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Configuring Quality of Service (Rate Limitation)

The **Rate Limitation** command enables you to configure rate limits for IPmux-24, in order to maintain Quality of Service (QoS) during times of high network traffic. You can select Ingress Rate Boundaries to define the rate limiting ranges for the ingress traffic. The actual data rate of the incoming traffic is selected from the rates limited by the boundaries. These boundaries are applied to the regular and flooded Rate Limits. You can also select regular or flooded Rate Limits, to be applied to all frames.

➤ **To configure Quality of Service (Rate Limitation):**

1. Select **Configuration > QoS > Rate Limitation...**.

   The Rate Limitation dialog box appears (see *Figure 3-30*).

2. For each Ethernet port, configure the desired parameters as described in *Table 3-17* and click ‹**Set**›.

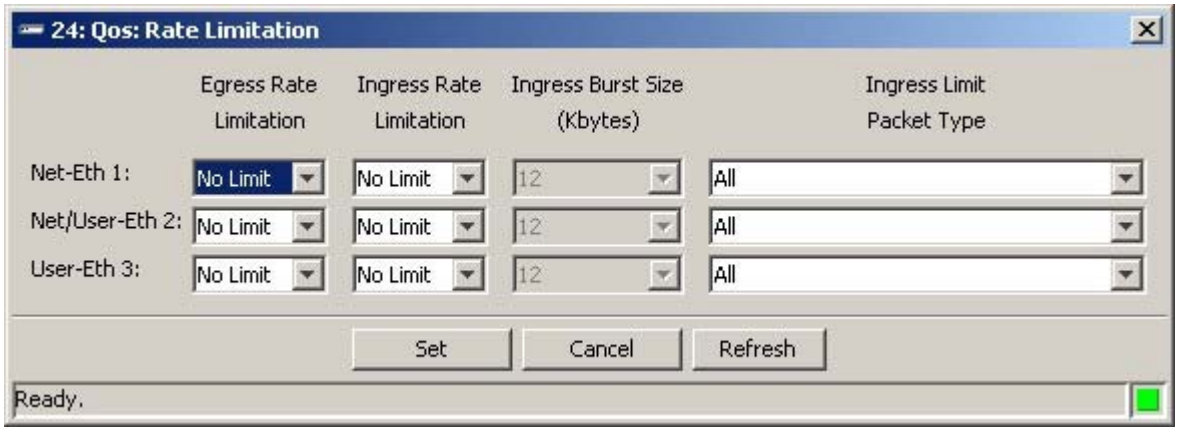

Figure 3-30. Rate Limitation Dialog Box

Table 3-17. Rate Limitation Parameters

Parameter	Possible Values / Remarks
Egress Rate Limitation (Mbps)	The maximum rate permitted to transfer via this port (per Ethernet port: NET–ETH 1/USER-2 /USER–ETH 3) **No Limit, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 41, 50, 60, 83, 125, 250**
Ingress Rate Limitation	The maximum rate permitted at ingress of this port with this Traffic Priority (per Ethernet port: NET–ETH 1/USER-2 /USER–ETH 3) **No Limit, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 41, 50, 60, 83, 125, 250**
Ingress Burst Size (Kbytes)	The burst size that the port can support beyond the rate limitation determined by value selected in **Egress Rate Limitation**. **12, 24, 48, 96** ***Note:*** *This parameter is only available is Ingress Rate Limitation ‹ › **No Limit**.*

Parameter	Possible Values / Remarks
Ingress Limit Packet Type	The packet type that will be rate limited. Rate limitation is determined by value selected in **Egress Rate Limitation**. **All** – all packet types are rate limited **Broadcast, Multicast and Flooded Unicast** – Broadcast, Multicast and Flooded Unicast are rate limited **Broadcast and Multicast** – Broadcast and Multicast packets are rate limited **Broadcast** – Broadcast packets are rate limited
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

3.2 Setting the Operational Parameters

Configuring IPmux-24 Ports at the Physical Layer

Configuring the E1/T1 Ports

The E1/T1 Interface **Parameters** command enables you to configure the various parameters of the E1/T1 port (the port's software configuration). The parameters vary according to the port type.

➤ **To display or configure E1/T1 parameters:**

1. Click an E1/T1 port.
2. Select **Configuration > Parameters...**.

   The E1 or T1 Interface Parameters dialog box appears (see *Figure 3-31* and *Figure 3-32*).
3. Configure the desired parameters as described in *Table 3-18* and click ‹**Set**›.

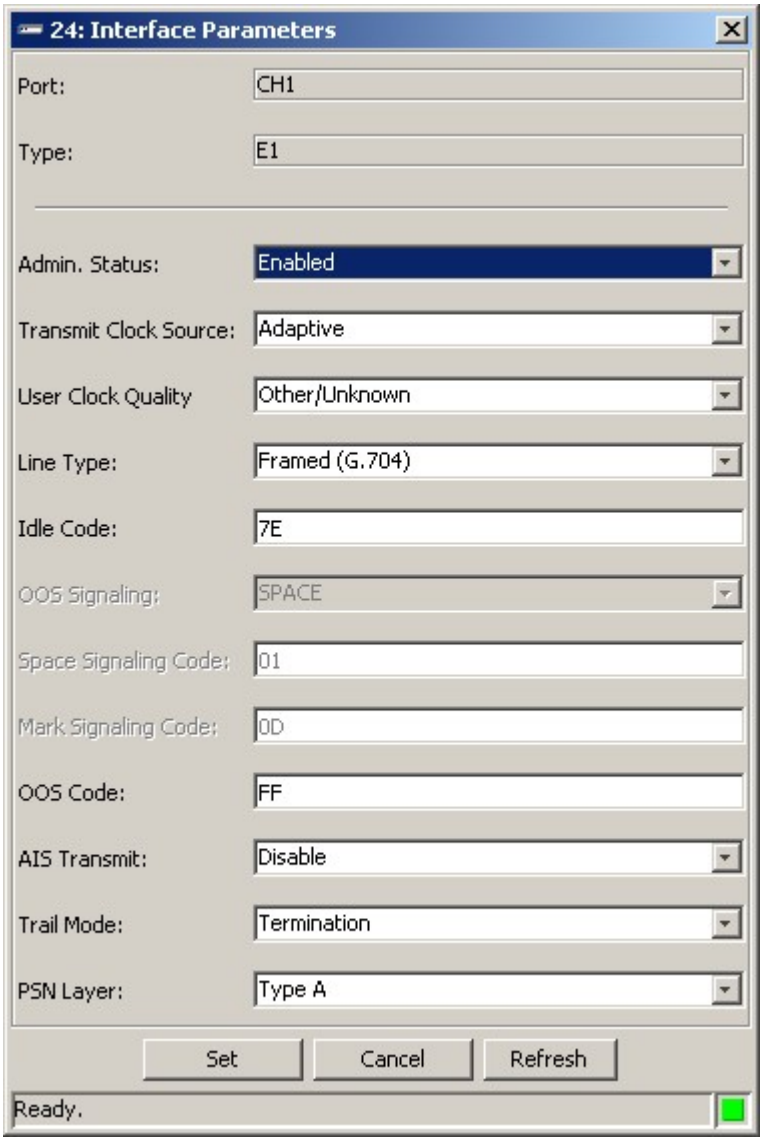

Figure 3-31. E1 Interface Parameters Dialog Box

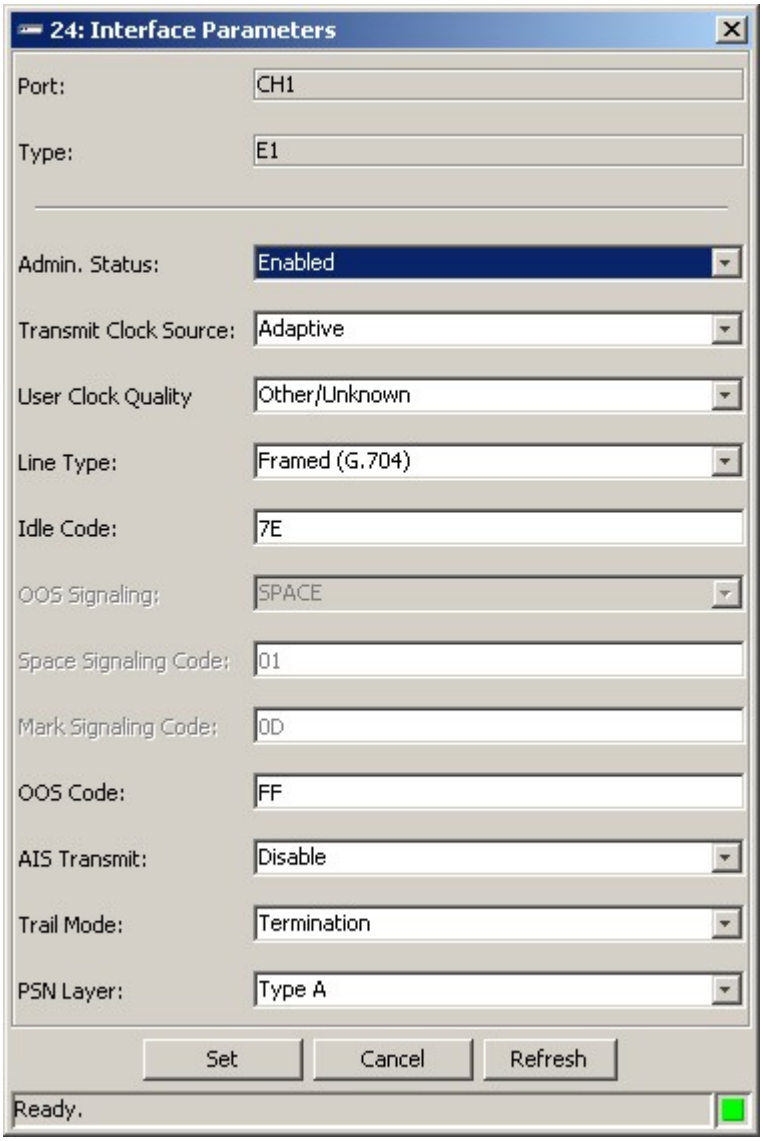

Figure 3-32. T1 Interface Parameters Dialog Box

Table 3-18. E1/T1 Interface Parameters

Parameter	Possible Values / Remarks
Port	**E1, T1**
Admin Status	**Enable, Disable**
Transmit Clock Source	Source of the transmit clock **Adaptive** - Adaptive clock regeneration **Loopback** - Transmit clock recovered from received data **Internal** - Local clock source, either the internal clock or an external clock that is directly attached to IPmux-24 **System** - Recovered from the other interface network and used for data transmission on this interface. This option is only available when the external clock is operational. Default: **Adaptive**

Parameter	Possible Values / Remarks
User Clock Quality	Marks the quality level of clock **ST1** - Stratum-1 Clock (0x10) **ST2** - Stratum-2 Clock (0x70) **ST3** - Stratum-3 Clock (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) Default: **ST1** ***Note:*** *If Network Type = Type A, only ST1 and ST2 are available.* The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local
Rx Sensitivity	Determines the maximum attenuation of the receive signal that can be compensated for by the interface receive path **Long Haul** - -32 dB **Short Haul** - -10 dB
Line Type	Line type affects the number of bits per second that the link can reasonably carry. It also affects the interpretation of the port performance statistics. For E1 ports: **Framed (G.704), Framed-CRC, Framed-MF, Framed-CRC-MF** **Unframed (G.703) -** Use when the data being transmitted is unframed. For T1 ports: **ESF** - Extended SuperFrame **D4** - AT&T D4 format **Unframed -** Use when the data being transmitted is unframed. ***Note:*** *Line Type is grayed out and can't be changed when a bundle is defined over the selected interface.*
Line Code (only applicable for T1 ports)	Type of Zero Code Suppression used on the link **B7ZS, B8ZS, AMI**
Idle Code (not applicable when the Line Type is unframed)	Byte pattern of the data transmitted in the E1/T1 Framer idle timeslots **0** to **FF**
Signaling Mode (only applicable for T1 ports)	Type of signaling used on the link **None, Robbed Bit**
Line Interface	T1 device operation mode **DSU, CSU** ***Note:*** *Only applicable for T1 ports*

Parameter	Possible Values / Remarks
Line Length (feet)	**0-133, 134-266, 267-339, 400-533, 534-655** ***Note:*** *Only applicable for T1 ports with Line Mode DSU*
Line Buildout (dB)	Transmit line gain for T1 CSU line mode **0, -.5, -5, -2.5** ***Note:*** *Only applicable for T1 ports* with *CSU Line Mode*
Restore Time (sec)	Used to change the sync. Algorithms to reduce the time required for the port to return to normal operation after a RED (LOF - loss of frame synchronization) alarm. **1, 10** ***Note:*** *Only applicable for T1 ports. Not applicable when the Line Type is Unframed.*
OOS Signaling	Defines the value to be sent as a signal after alarm detection: **Space** - Both A and B signaling bits are forced to '0' during out-of-service periods **Mark** - Both A and B signaling bits are forced to '1' during out-of-service periods **Space_Mark** - A and B bits are forced to '0' for 2.5 seconds; then they are switched to '1' until out-of-service condition disappears **Mark_Space** - A and B bits are forced to '1' for 2.5 seconds; then they are switched to '0' until out-of-service condition disappears
Space Signaling Code	Space Signaling Code – value to be sent as a signal during the first 2.5 seconds after alarm detection E1, T1-ESF: **1..F** T1-SF(D4): **1..4**
Mark Signaling Code	Trunk conditioning signal value after alarm detection E1, T1-ESF: **1..F** T1-SF(D4): **1..4**
OOS Code	Trunk conditioning data pattern to be sent upon a DS0 fail ***Note:*** *When Line Type is set to* ***Unframed****, OOS Code is grayed out and its value cannot be changed.*
AIS Transmit	**Enable, Disable**
Trail Mode	Enables the end-to-end transfer of TDM OAM in framed mode, when theirTDMoIP Payload Format is set to **V2**. **Termination** - Trail mode is disabled **Extension** - Trail mode is enabled
Network Type	The network layer from which the clock is derived. **Type A = 12** **Type B = 13** ***Note:*** *This parameter is only applicable when Transmit Clock Source =* ***Adaptive****.* ***Note:*** *If Network Type is set to Type A and User Clock Quality is set to ST3, ST3E or Other, the following message is displayed in the status bar: "For Network Type A the only valid values of User Clock Quality are ST1, ST2".*
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.

Parameter	Possible Values / Remarks
[Refresh]	Click to refresh the information in the window.

Configuring the Ethernet Ports

The Ethernet Interface **Parameters** command enables you to configure the various parameters of the Ethernet port (the port's software configuration).

➤ **To set configuration parameters for the Ethernet interface:**

1. Click the User or Network Ethernet port.
2. Select **Configuration › Parameters...**

   The Ethernet Interface Parameters dialog box appears (*Figure 3-33*).
3. Configure the desired parameters as described in *Table 3-19* and click ‹**Set**›.

Note *The User Ethernet rate is the smaller value of User Rate Limit and (100-TDMoIP traffic).*

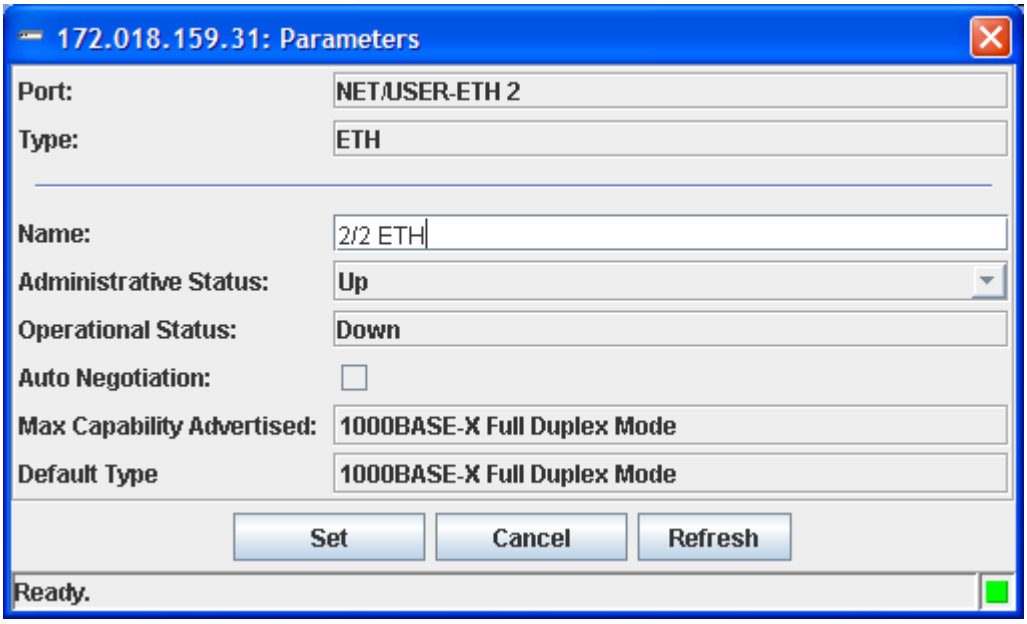

Figure 3-33. IPmux-24 Interface Parameters Dialog Box – Network/User Port

Table 3-19. Ethernet Interface Parameters

Parameter	Possible Values / Remarks
Port	The selected port. **NET-ETH 1, NET/USER-ETH 2, USER-ETH 3** Read only
Type	**ETH**
Name	Port name **NET-ETH 1, NET/USER-ETH 2, USER-ETH 3** Read only for internal ETH

Parameter	Possible Values / Remarks
Adminstrative Status	The desired state of the link. **Down, Up**
Operational Status	The actual link status. **Up, Down, Testing**
Auto Negotiation	**Checked** (enabled), **Unchecked** (disabled) ***Note:*** *Disabled for fiber optic Ethernet interface.* ***Notes:*** *This parameter is not available for internal ETH.*
Max Capability Advertised	Defines the maximum capabilities of the interface. **10BASE-T half duplex mode, 10BASE-T full duplex mode, 100BASE-TX half duplex mode, 100BASE-TX full duplex mode** ***Note****: Working in half duplex mode is not optimal and might cause communication problems.* *Disabled for fiber optic Ethernet interface.* ***Notes:*** *This parameter is not available for internal ETH.* *This parameter is read only for SFP connector.*
Default Type	**10BASE-T half duplex mode, 10BASE-T full duplex mode, 10BASE-TX half duplex mode, 10BASE-TX full duplex mode** ***Notes:*** *This parameter is read only for internal ETH.* *This parameter is read only for SFP connector.*
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Note

- *Changing the Boundaries parameter automatically changes the set of values that may be selected for the User1 and User2 ports in the Rate Limit and Flooded Rate Limit combo-boxes. For Network ports, it only changes the set of values that may be selected in the Flooded Rate Limit combo-box. When the set of selectable values for a combo-box is automatically changed, its parameter value is set to **Disable**.*
- *For user ports (User1, User2), Flooded Rate Limit is only available when Rate Limit is set to **Disable**. If Rate Limit is not set to **Disable**, then Flooded Rate Limit is grayed out, and its value is not used.*
- *If Flooded Rate Limit is not set to **Disable** then Rate Limit is grayed out, and its value is not used.*

Note

*When **Auto Negotiation** is disabled and **Max Capability Advertised** is different from the capabilities of the LAN, for example, when Max Capability is 100BaseT full duplex, while the LAN is in 10BaseT half duplex, the NMS will disconnect.*

Configuring the Internal Ethernet Ports

The Internal Ethernet Interface **Parameters** command enables you to configure the various parameters of the Internal Ethernet port.

➤ **To set configuration parameters for the Internal Ethernet interface:**

1. Click the Internal Ethernet port.
2. Select **Configuration > Interface...**

   The Internal Ethernet Interface Parameters dialog box appears (see *Figure 3-34*).
3. Configure the desired parameters as described in *Table 3-20* and click ‹**Set**›.

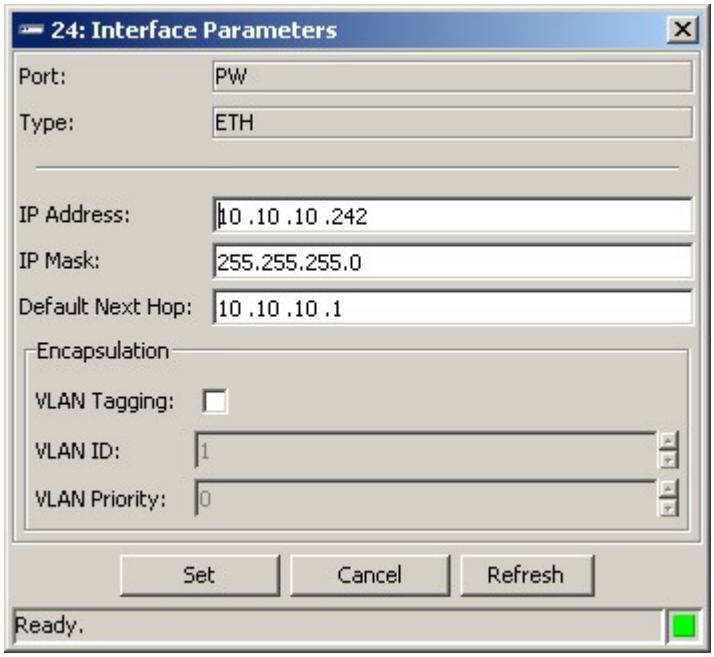

Figure 3-34. Internal Ethernet Interface Parameters Dialog Box

Table 3-20. Internal Ethernet Interface Parameters

Parameter	Possible Values / Remarks
Port	The selected port. Read only
Type	**ETH**
IP Address	The host interface IP address.
IP Mask	The host interface subnet mask.
Default Next Hop	The host interface default Next Hop address. This address is used as the default next hop for every Bundle mapped to this host.
Encapsulation	
VLAN Tagging	VLAN Tagging **No, Yes** ***Note:*** *If VLAN Tagging =* ***Yes****, the VLAN ID and VLAN Priority values will be used for the bundles.*
VLAN ID	Host VLAN ID **1...4095**

Parameter	Possible Values / Remarks
VLAN Priority	Host VLAN frame priority. **0..7**
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Assigning Timeslots to Bundles

Bundles are groups of timeslots. The Bundle Table displays the details of each bundle in the upper section of the table, and a representation of each timeslot with the bundle assigned to it in the lower section of the table. Each bundle can be assigned to multiple timeslots, but each time slot can only have one bundle assigned to it.

The **Bundles** command enables you to assign timeslots to bundles, and to remove the timeslot assignments from bundles.

➤ **To view bundles for an E1/T1 port:**

1. Click an E1/T1 port.
2. Select **Configuration > Bundles...**

   The Bundles Table appears (see *Figure 3-35*).
3. Configure the desired parameters as described in *Table 3-1* and click ‹**Close**›.

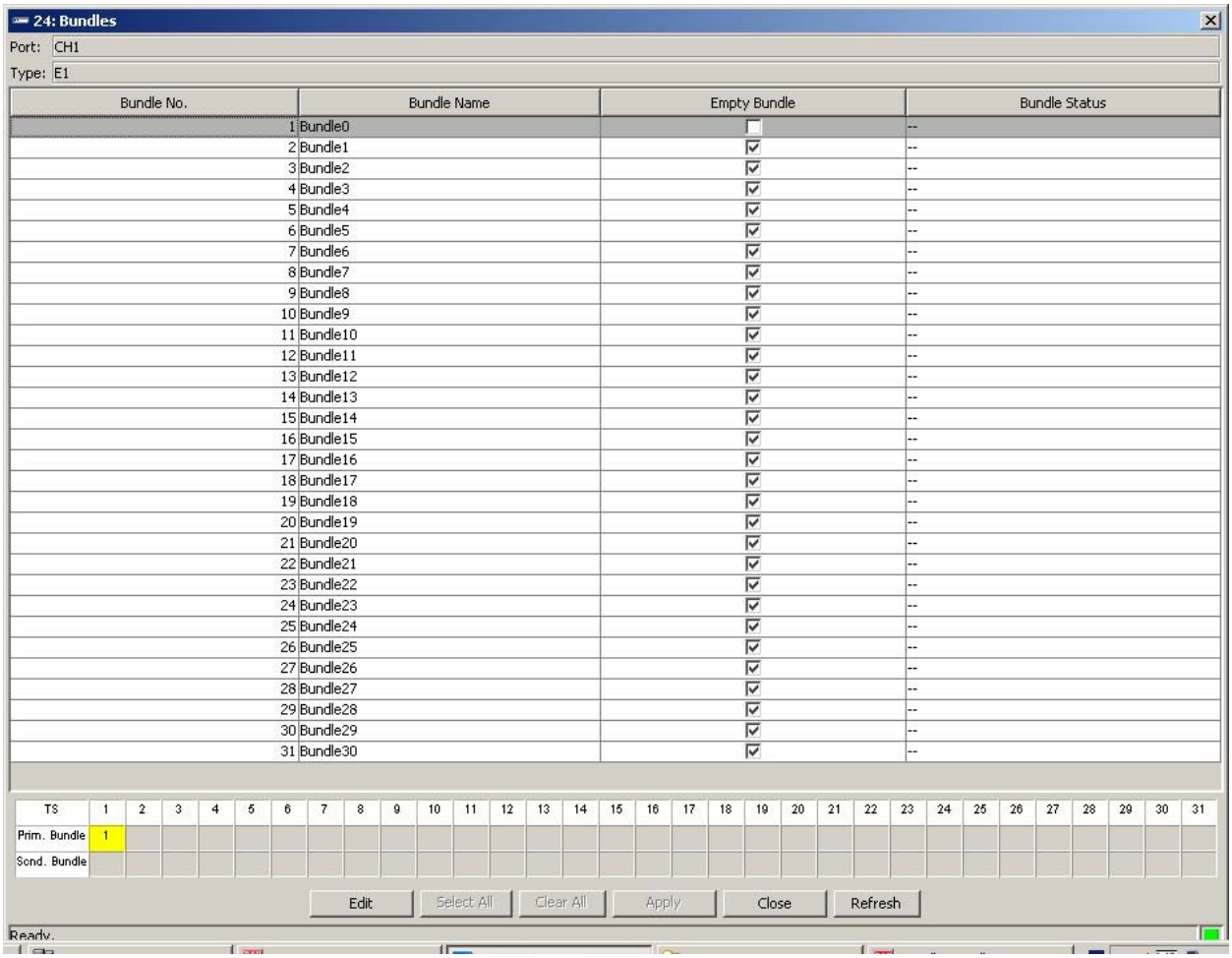

Figure 3-35. Bundles Table – Port Level

Table 3-21. Bundle Configuration Table Parameters – Port Level

Parameter	Possible Values/Remarks
Port	The selected port. Read only
Type	**ETH**
Bundle No.	Bundle Number
Bundle Name	Name of the selected bundle
Empty Bundle	When checked, indicates the bundle has not been assigned to any TSs (timeslots)
Bundle Status	Status of the bundle **Connected, Disabled, Remote Fail, Local Fail, Unavailable, Validation Fail, Sequence Error, Buffer Underflow, Buffer Overflow**
Time Slots	The timeslots and the bundles assigned to them. Timeslots with bundles assigned to them are marked with a dark blue box, while unassigned timeslots are marked with a gray box. A T1 port has 24 timeslots that can be assigned to a bundle; an E1 port has 31 (without MF) or 30 (with MF).
[Edit]	Click to select an available time slot for a selected bundle.
[Select All]	Click to select all available time slots for a selected bundle.

Parameter	Possible Values/Remarks
[Clear All]	Click to remove all selected time slots from a selected bundle.
[Apply]	Click to apply changes.
[Close]	Click to apply Bundle Configuration Table Parameters and close the dialog box.
[Refresh]	Click to refresh the information in the window.

Selecting an Available Time Slot

➤ **To select an available timeslot:**

1. From the Bundles Table just described, select a bundle and click ‹**Edit...**›.
2. Click the square beneath the timeslot number.

   The selected timeslots appear yellow.
3. Click ‹**Apply**›.

Selecting all Available Time Slots

➤ **To select all available timeslots for the selected bundle:**

- From the Bundles Table just described, select a bundle and click ‹**Select All**›.

Removing all Selected Timeslots from a Bundle

➤ **To remove all selected timeslots from the selected bundle:**

- From the Bundles Table just described, select a bundle and click ‹**Clear All**›.

Note *You cannot edit a bundle that has already been used to define a connection in the Bundle Connection Table (Figure 3-37). To edit such a bundle, first delete the bundle from the Bundle Connection Table (Figure 3-37), and then return to the Bundle Table to select new parameters.*

Managing Bundle Connections

Bundles are groups of timeslots. The **Bundle Connection Table** command displays the detailed technical parameters of each bundle in the system. Although you can use the Element Manager to view the bundle connections and to remove them, complete management of bundle connections is accomplished using the Service Center map. For information on managing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual.

Creating Bundle Connections

For information on creating and managing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual.

Removing Bundle Connections

For information on removing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual. In cases where a circuit is broken, you may use the Bundle Connection Table to manually remove a bundle connection.

➤ **To display the bundle connection table:**

1. Select **Configuration > Bundle Connection Table...**.

   The Bundle Connection Table appears (see *Figure 3-36* and *Figure 3-37*).

2. Configure the desired parameters as described in *Table 3-22* and click ‹**Close**›.

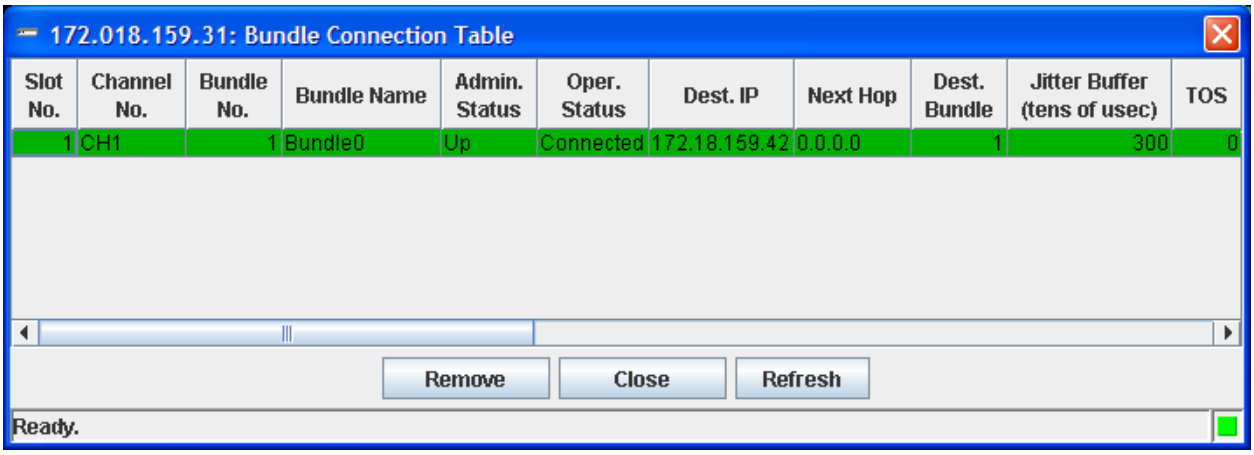

Figure 3-36. Bundle Connection Table (left side)

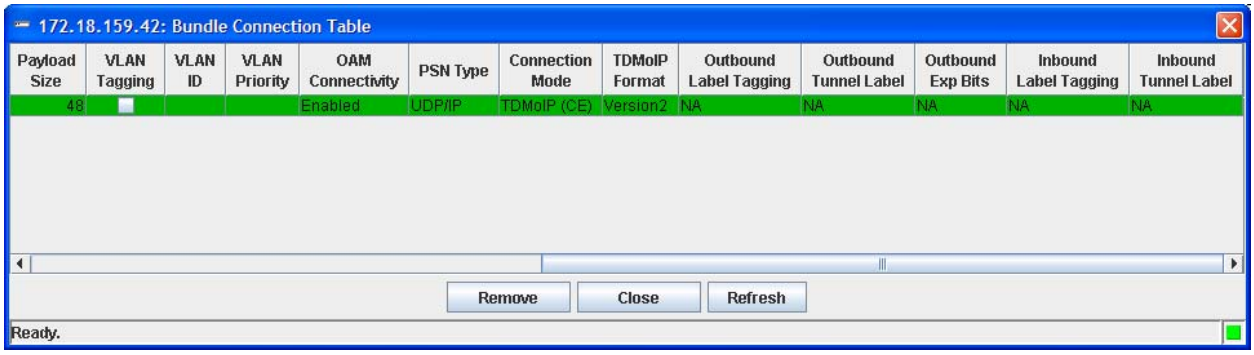

Figure 3-37. Bundle Connection Table (right side)

Table 3-22. Bundle Connection Table Parameters

Parameter	Possible Values/Remarks
Slot No.	**1**
Channel No.	**1..4**
Bundle No.	**1..31** ***Note:*** *A maximum of 16 bundles is allowed*
Bundle Name	Bundle name of the selected channel. The Table displays one bundle name per line.

Parameter	Possible Values/Remarks
Admin. Status	**Down, Up**
Oper Status	**Connected, Disabled , Remote Fail, Local Fail, Unavailable, Validation Fail, Standby**, **Sequence Error**, **Buffer Underflow**, **Buffer Overflow**
Dest. IP	Logical name or IP address of the destination IPmux
Next Hop	IP address to which the Ethernet frame will be sent when the Dest. Name IP is not in the device subnet
Dest. Bundle	Bundle number in the destination IPmux device **1..496**
Jitter Buffer (tens of µsec)	Depth of the jitter buffer (per-link, elastic buffer, whose size is configurable in units of 10 micro seconds (µs). E1: **0..37..3200** T1: **0..37..2400**
ToS	IP ToS (Type of Service) assigned to this channel: **0..255** Configures the IP ToS field in the IP frames transmitted by the device. Configures the entire byte – not only the 3 ToS bits. ToS assignment applies to all TDM packets leaving IPmux.
TDM Bytes in Frame	UDP payload (one-eight) length enabling reduction of Ethernet throughput. E1/T1: **48..1440** (steps of 48) T3/E3: **240..1440** (steps of 48) SAToP: **1..45** CESoPSN: **1..1440** ***Note:*** *Applicable only when Connection Mode is* ***TDMoIP (CE)****.*
VLAN Tagging	**No, Yes**
VLAN ID	VLAN ID **1..4094**
VLAN Priority	VLAN priority **0..7**
OAM Connectivity	**Disabled** **Enabled**
Bundle Thoughput	Throughput in bps
PSN Type	Bundle encapsulation **MPLS/ETH** - Multi-Protocol Label Switching / Ethernet **UDP/IP**
Connection Mode	**SAToP** – Valid for Line Type = Unframed **CESoPSN** – Valid for Line Type = Framed **HDLCoPSN**
Outound Label Tagging	Outbound labels: **Disabled, Enabled** ***Note:*** *Available only when PSN Type is MPLS/ETH.*

Parameter	Possible Values/Remarks
Outbound Tunnel Label	MPLS transmit label: **0..1048576** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
Outbound EXP Bits	The MPLS Network priority (EXP bits) used for this bundle **0..7**
Inbound Label Tagging	Inbound labels: **Disabled, Enabled** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
Inbound Tunnel Label	MPLS receive label: **0..1048576** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
[Remove]	Click to remove a bundle.
[Close]	Click to apply changes and close the dialog box.
[Refresh]	Click to refresh the information in the window.

Removing a Bundle

➤ **To remove a bundle:**

1. Select a bundle in the Bundle Connection Table.
2. Click ‹**Remove**›.

   A warning message appears.

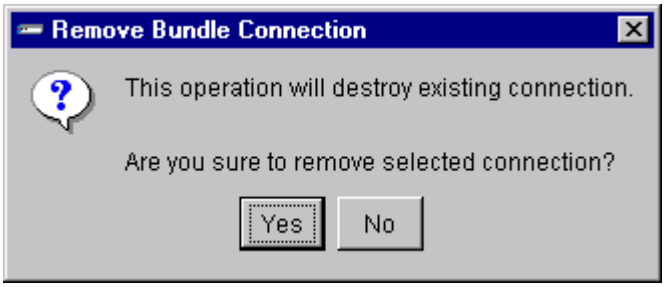

Figure 3-38. Remove Bundle Connection

3. Click ‹**Yes**› to confirm.

3.3 Additional Tasks

Displaying Ethernet Interface Information

The Ethernet **Interface Information** command enables you to display the various parameters of the Ethernet port. You can use this information as a troubleshooting aid, to ensure that the Ethernet cable is working properly and that the connection is at the appropriate speed at half/full duplex.

➤ **To display information about the Ethernet interface:**

1. Click the Ethernet port.
2. Select **Configuration > Interface Info...**.

   The Interface Information table appears (see *Figure 3-39*). For a description of the parameters, refer to *Table 3-23*.

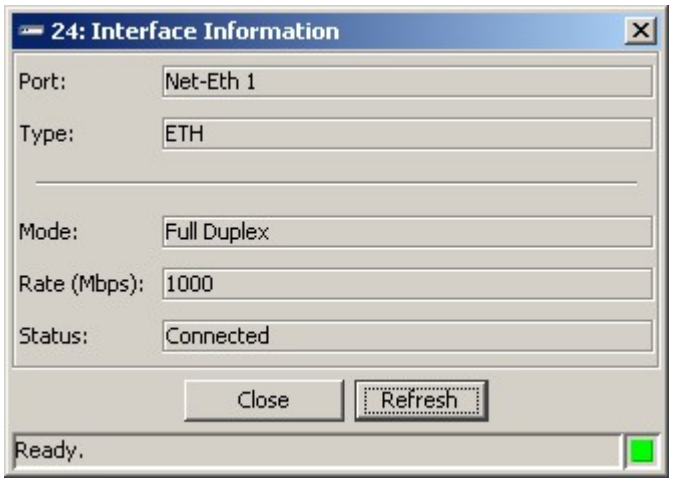

Figure 3-39. Interface Information – Network/User Port

Table 3-23. Interface Information Table Parameters

Parameter	Possible Values / Remarks
Port	**NET–ETH 1, NET/USER–ETH 2, USER–ETH 3**
Type	**ETH**
Mode	Transmission mode: **Full Duplex, Half Duplex**
Rate (Mbps)	Transmission rate: **10, 100, 1000**
Status	Status of the link: **Connected, Not Connected**
Interface Type	According to wavelength and laser mode **1300nmSM or 1300nm (single mode/multimode)** ***Note: This parameter only appears*** *for fiber optic Ethernet interface*
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Displaying Ethernet SFP Information

➤ **To display information about the Ethernet SFP:**

1. Click the Ethernet port.
2. Select Configuration › SFP Info....

   The SFP Information table appears (see *Figure 3-40*). For a description of the parameters, refer to *Table 3-24*.

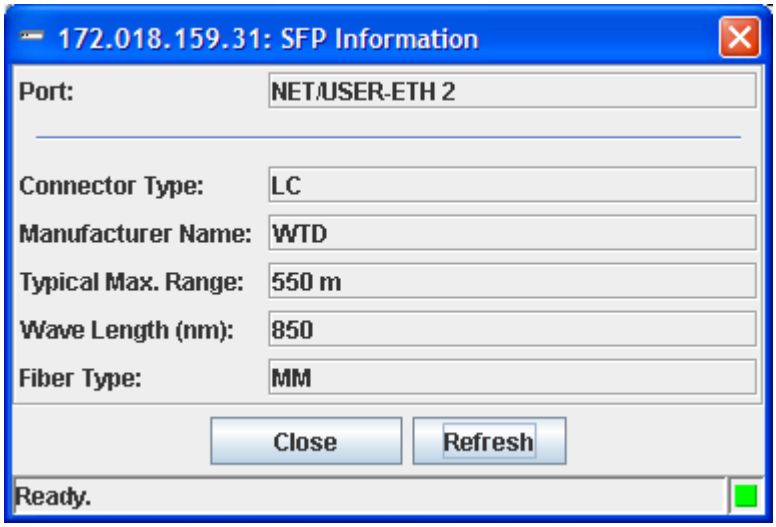

Figure 3-40. SFP Information Dialog Box

Note *SFP information is not available for Internal ETH port.*

Table 3-24. SFP Information Table Parameters

Parameter	Possible Values / Remarks
Port	NET–ETH 1, NET/USER–ETH 2, USER–ETH 3
Connector Type	The specific port or interface. Fiber optic connectors: **LC** Copper connectors: **RJ-45** **Vendor Specific**
Manufacturer Name	SFP port manufacturer name.
Typical Max. Range	The maximum range supported by the SFP port in meters. For Optical SFP: • Values < = 1km are displayed in meters with 10 meter resolution, *Example: 320 m* • Values › 1kmare displayed in Km with 0.1 Km resolution. *Example: 3.7 Km* For Copper SFP: • Values are displayed in meters with 1meter resolution, Example: 238 m

Parameter	Possible Values / Remarks
Wavelength (nm)	The wavelength of an Optical interface/port in nm, as well as an indication if it is LASER. **850, 1310, 1310 LASER, 1550 LASER, 1470 LASER, 1490 LASER, 1510 LASER, 1530 LASER, 1570 LASER, 1590 LASER, 1610 LASER** ***Note:*** *This parameter is only enabled if the SFP is Optical.*
Fiber Type	**The laser mode of an Optical Laser interface/port.** **SM, MM** ***Note:*** *This parameter is only enabled if the SFP is Optical.*
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Displaying Ethernet Optical SFP Information

➤ **To display information about the Ethernet Optical SFP:**

1. Click the Ethernet port.
2. Select **Configuration > Optical Parameters...**

   The Optical SFP Information table appears. For a description of the parameters, refer to *Table 3-25*.

Note *Optical SFP information is not available for Internal ETH port.*

Table 3-25. Optical SFP Information Table Parameters

Parameter	Possible Values / Remarks
Port	The selected Ethernet port. **NET-ETH 1, NET/USER-ETH 2, USER-ETH 3**
A vertical bar graph is displayed for each of the optical paramaters indicating the actual levels.	
Tx Optical Power (dBm)	A vertical bar graph representing the transmitted optical power level. Beneath the bar graph, the current, maximum and minimum values are displayed as well. **-40.0...8.2**
LASER Bias Current (mA)	A vertical bar graph representing the LASER bias current level, Beneath the bar graph, the current, maximum and minimum values are displayed as well. **0.0...131.0**
LASER Temp (°C / °F)	A vertical bar graph representing the LASER temperature level. Beneath the bar graph, the current, maximum and minimum values are displayed as well. For °C: **0.0...100.0** For °F: **32.0...212.0**
Rx Optical Power (dBm)	A vertical bar graph representing the received optical power level. Beneath the bar graph, the current, maximum and minimum values are displayed as well. **-40.0...8.2**

Parameter	Possible Values / Remarks
Supply Voltage (Volt)	A vertical bar graph representing the supply voltage. Beneath the bar graph, the current, maximum and minimum values are displayed as well. **0.0...+6.5**
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Resetting IPmux-24 to the Default Configuration

The **Default Configuration** command enables you to reset the Agent's configuration back to the factory defaults. Use this command when you wish to reconfigure all of the parameters from a clean starting point. This is useful when IPmux-24's current configuration is completely unsatisfactory, such as when moving a device to another site, or if the configuration database has become corrupted or the device's software has been upgraded.

➤ **To set the selected IPmux-24 to the default configuration:**

1. Select **Configuration > System Commands > Default Configuration**.

   A confirmation message appears (*Figure 3-41*).

2. Click <**OK**> to confirm reset of the default configuration.

   The default configuration replaces the current configuration.

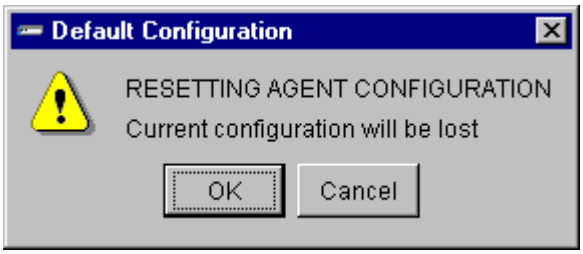

Figure 3-41. Default Configuration Dialog Box

Polling the Agent

RADview periodically and automatically reads (polls) IPmux-24 variables. You can force RADview to immediately poll the Agent and update the display by polling IPmux-24 manually. The **Poll Agent** command is useful if you configure the device NOT to perform periodic polling of the Agent.

➤ **To poll the agent:**

- Select **Configuration > System Commands > Poll Agent**.

  RADview polls IPmux-24 and updates any displayed information.

Resetting IPmux-24

The **Reset** command enables you to reset the Agent's hardware to re-initialize the main board CPU of the IPmux-24 unit. Use this command to reset IPmux-24 in the unlikely event that the device is unresponsive (has locked up) or is behaving erratically.

➤ **To reset IPmux-24:**

1. Select **Configuration > System Commands > Reset**.

   A confirmation message appears (*Figure 3-42*).

2. Click <**OK**> to confirm.

   The Agent's hardware resets; the IPmux-24 unit is re-initialized and its active software is decompressed and loaded into the RAM.

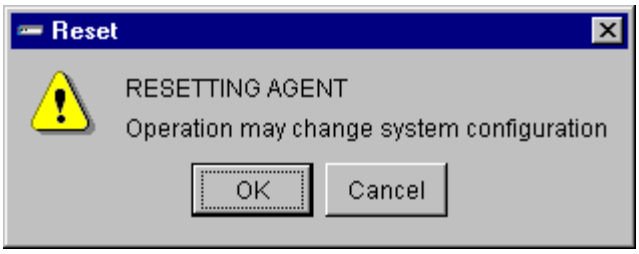

Figure 3-42. Reset Agent Dialog Box

Note *The reset operation implements any changes made to the IPmux-24 configuration.*

Chapter 4

Configuring Typical Applications

This chapter provides detailed instructions for setting up a typical application using two IPmux units, and contains the following sections:

- *Configuring the IPmux-24 Units*
  - *Configuring the Host IP Parameters*
  - *Configuring the Manager List*
- *Connecting IPmux-24 to the Management Station*
- *Configuration Sequence*
- *Creating Circuits*
  - *Creating a Mesh Service Circuit*
    - *Defining the E1 Parameters*
    - *Creating a Circuit*
    - *Saving the Circuit Parameters*
    - *Displaying the Circuit Parameters*
  - *Creating a Normal Service Circuit*
    - *Defining the E1 Parameters*
    - *Creating a Circuit*
    - *Saving the Circuit Parameters*
    - *Displaying the Circuit Parameters*

This chapter provides detailed instructions for configuring two IPmux-24 units operating opposite each other (see *Figure 4-1*).

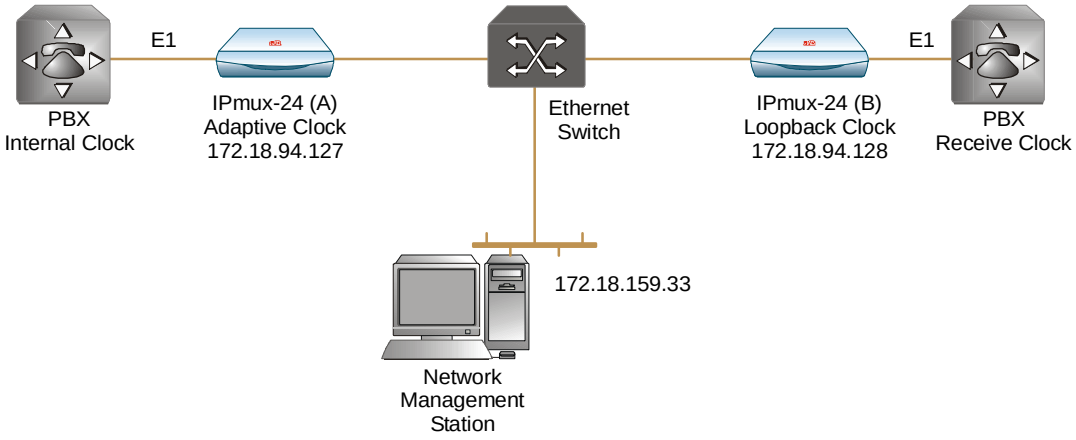

Figure 4-1. IPmux-24 Units Operating Opposite Each Other

Certain guidelines are relevant to this application. In general, there are four basic configuration steps (described below) that need to be followed when deploying any IPmux unit.

1. IP Configuration – Setting the device host IP address and the manager IP address.
2. Physical layer configuration – Setting the TDM parameters (line type, clocking, etc.) according to the application requirements and topology.
3. Creating a circuit via the Service Center.

Table 4-1. Configuration Summary

Device	E1 Parameters	IP Parameters	Bundle Parameters	Bundle Connection
IPmux-24 (A)	• Transmit clock source: adaptive • Line type: Framed G.704 CRC-4 enabled • CAS: disabled	Host IP address: 172.18.94.127	Bundle 1 Timeslots in bundle: 1–10	Bundle 1 of IPmux-24 (B)
IPmux-24 (B)	• Transmit clock source: Loopback • Line type: Framed G.704 CRC-4 enabled • CAS: disabled	Host IP address: 172.18.94.128	Bundle 1 Timeslots in bundle: 1–10	Bundle 1 of IPmux-24 (A)

4.1 Configuring the IPmux-24 Units

This section explains how to configure the IPmux units. The configuration procedure is similar for both units, except for defining different host IP addresses, different clocking modes and different destination IP addresses for the bundle connection.

Configuring the Host IP Parameters

The host IP parameters are configured via the terminal application.

➤ To configure the host IP parameters:

1. Display the Host IP menu (**Configuration > System > Host IP**), and configure the IP address and mask of the host:
   - IPmux-24 (A) host IP address – 172.18.94.127
   - IPmux-24 (B) host IP address – 172.18.94.128
2. Save the changes.

```
Configuration>System>Host IP
1. IP address                          ... (172.18.94.127)
2. IP mask                             ... (255.255.255.0)
3. Default gateway                     ... (0.0.0.0)
4. DHCP                                    (Disable)
5. DHCP Status                         >

>

Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                      1 Mngr/s
```

Figure 4-2. Configuring Host IP Parameters for IPmux-24 (A)

Configuring the Manager List

➤ To configure the manager list:

1. Display the Manager List menu (**Configuration > System > Management > Manager list**), and enter IP parameters for the network manager station:
   - NMS IP address – 172.17.10.100
   - Manager location – Network-Eth1.
2. Save the changes.

```
Configuration>System>Management>Manager List
1. Manager IP address            ... (172.18.159.33)
2. Manager location              >   (Network-Eth1)
3. Link up/down trap                 (Disable)
4. Alarm trap                        (Disable)
5. VLAN tagging                      (Disable)
>
Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                    1 Mngr/s
```

Figure 4-3. Configuring Network Manager

4.2 Connecting IPmux-24 to the Management Station

IPmux-24 can be managed by a Network Management Station (NMS) that is located on the LAN (hub or switch) connected to the one of the unit's Ethernet ports.

➤ To connect IPmux-24 to the Network Management Station:

1. Connect a Network Management Station to the LAN (hub or switch).
2. Connect one of the IPmux's Ethernet ports to the LAN.

4.3 Configuration Sequence

Several basic configuration steps need to be followed when deploying any IPmux unit:

1. IP Configuration – Setting the IPmux-24's host IP address and the manager IP address
2. Physical layer configuration – Setting the TDM parameters (line type, clocking, etc.) according to the application requirements and topology
3. Creating circuits via the Service Center.

IPmux-24 can be managed by a network management station that is located on the LAN connected to the one of the unit's Ethernet ports. In order to establish a proper connection, it is necessary to configure IPmux with a basic configuration.

➤ **To perform the preliminary IPmux-24 configuration:**

1. Connect an ASCII terminal to the IPmux-24 RS-232 control port.
2. Log in as Superuser (su).
3. Assign an IP address to IPmux-24.
4. Assign a subnet mask and a default gateway.
5. You can also enable or disable the IPmux-24 DHCP client.
6. Set read, trap, and read/write communities to public.
7. Set a manager IP address and location.

Note

Make sure that you save your settings at each configuration screen.

4.4 Creating Circuits

In the Service Center application, circuits can be created for Mesh and Normal Services. Both processes are outlined below.

Creating a Mesh Service Circuit

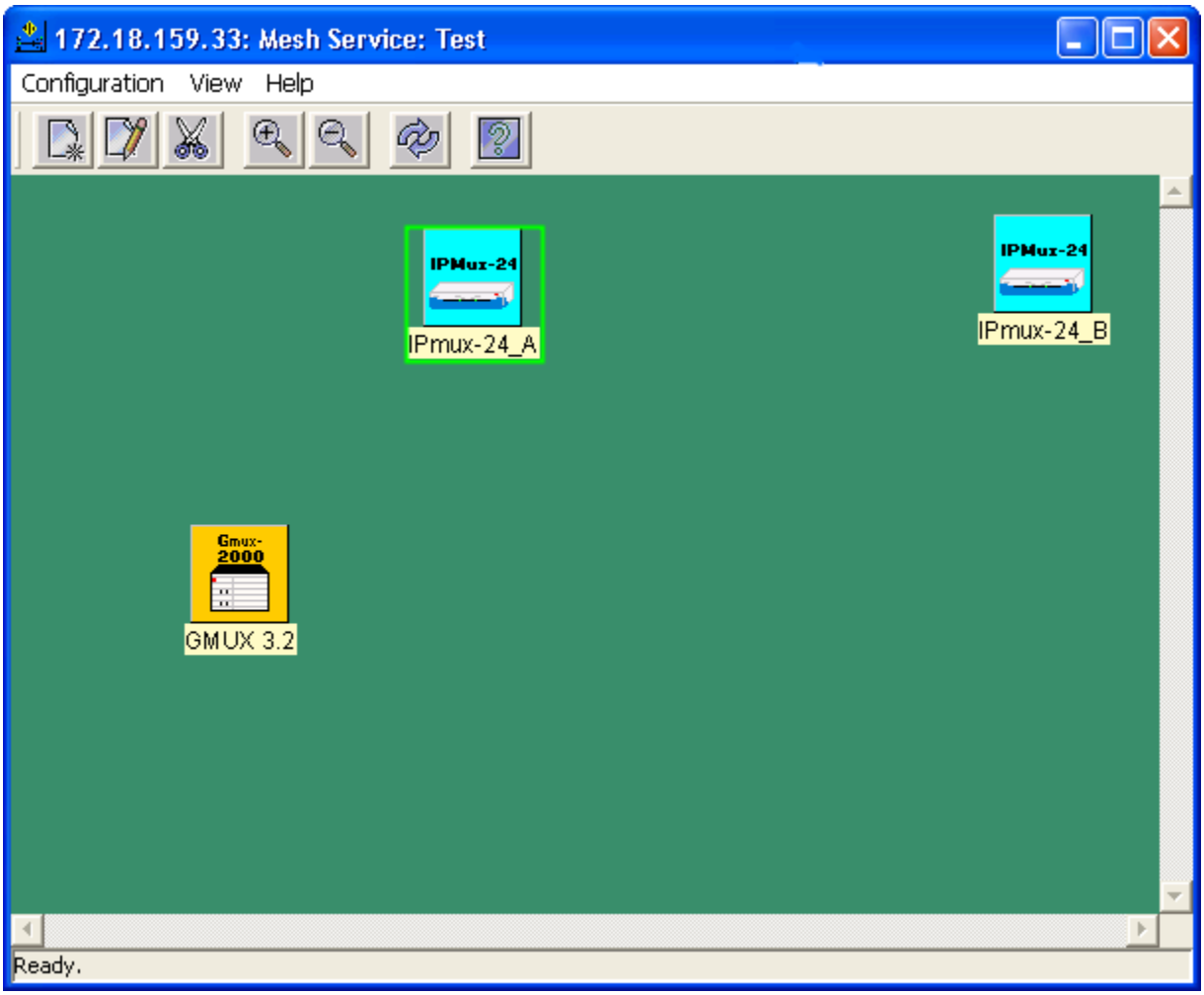

Figure 4-4. Mesh Services Map

Defining the E1 Parameters

➤ **To configure the E1 parameters for the source IPmux-24 (A):**

1. Double click on IPmux-24 (A) (172.18.94.127) in the Mesh Services Map (*Figure 4-4*).

   The Element Manager appears.

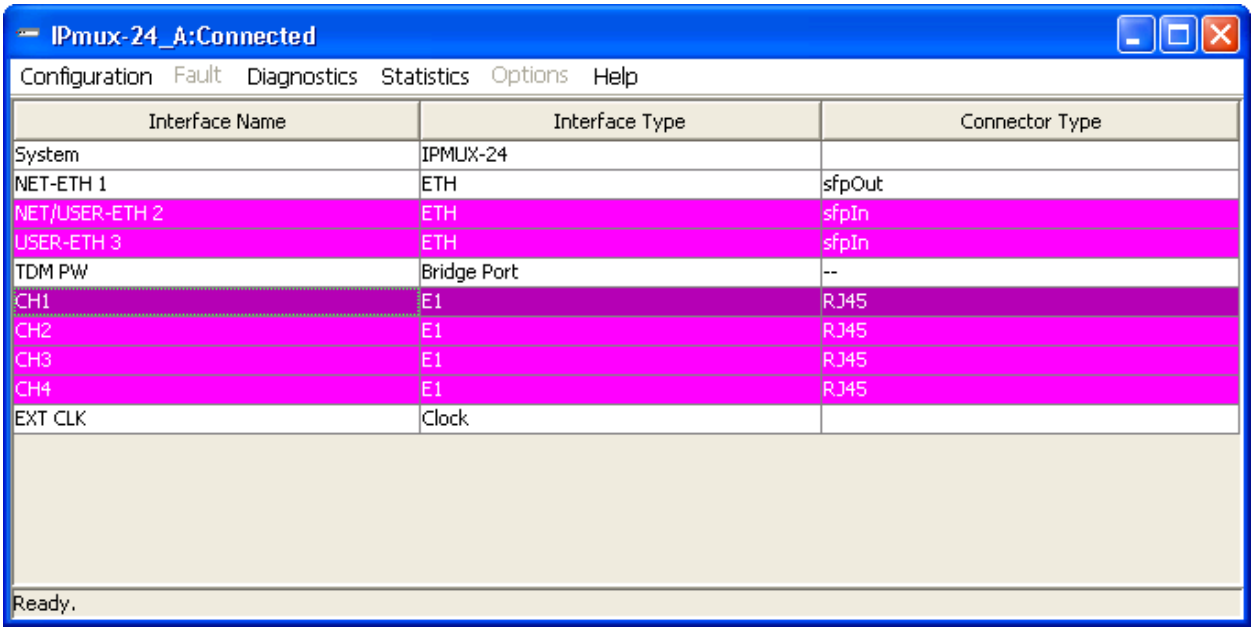

Figure 4-5. IPmux-24 (A) Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-6*).
4. Select the following parameters:
   - Transmit Clock Source = Adaptive
   - Line Type = Framed-CRC.
5. Click ‹**Set**›.

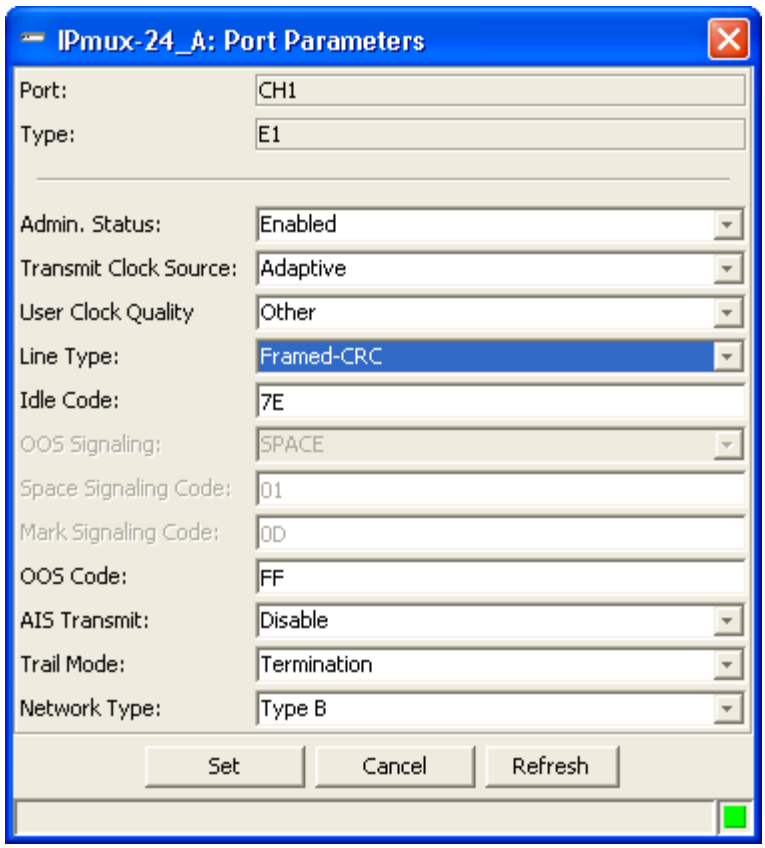

Figure 4-6. IPmux-24 (A) E1 Interface Parameters

➤ **To configure E1 parameters for IPmux-24 (B):**

1. Double click on IPmux-24 (B) (172.18.94.128) in the Mesh Services Map (*Figure 4-4*).

   The Element Manager appears.

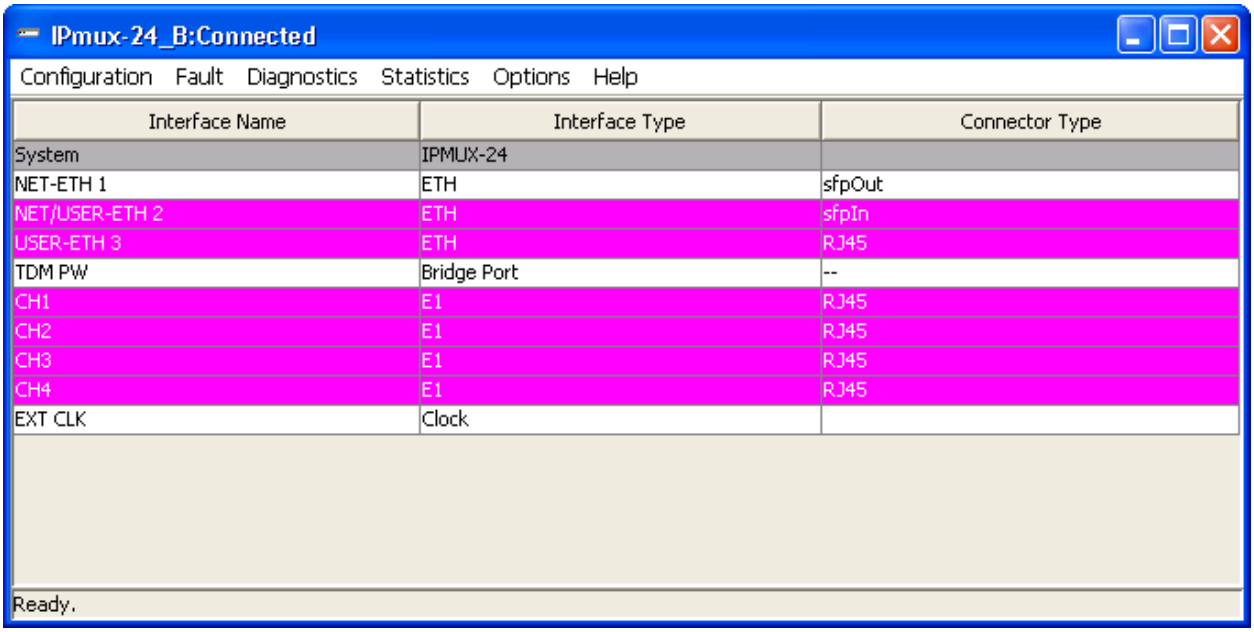

Figure 4-7. IPmux-24 (B) Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...
   The Interface Parameters dialog box appears (*Figure 4-8*).
4. Select the following parameters:
   - Transmit Clock Source = Loopback
   - Line Type = Framed-CRC.
5. Click <**Set**>.

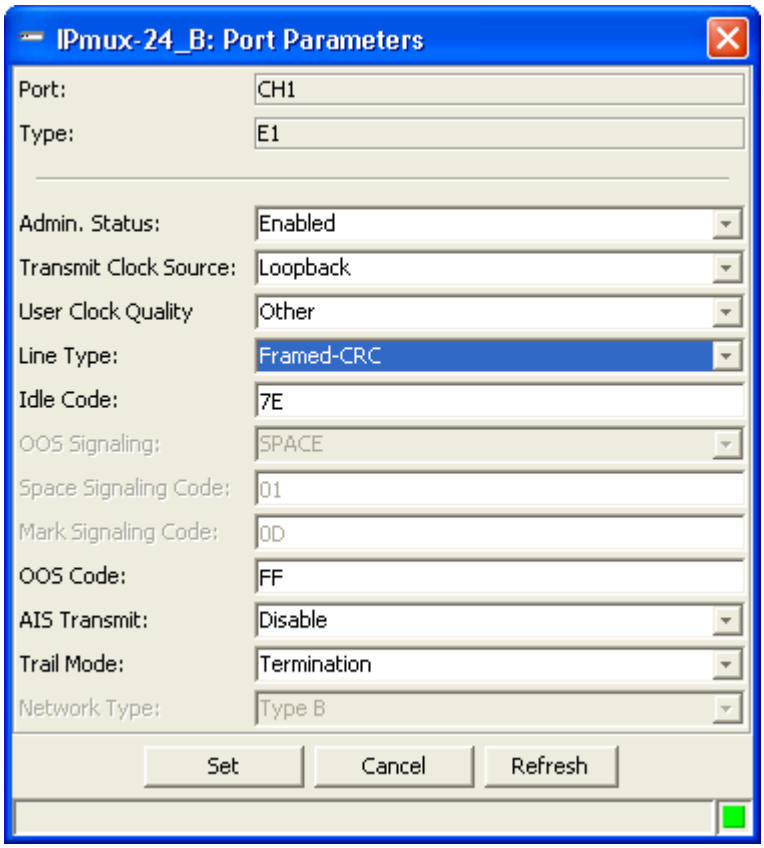

Figure 4-8. IPmux-24 (B) E1 Interface Parameters

Creating a Circuit

➤ **To create a circuit between IPmux-24 (A) and IPmux-24 (B):**

1. On the Services Map, select the source for the circuit. In this example it is the IPmux-24 (A).
2. While holding down the CTRL key, right click the mouse and drag a line between the source IPmux-24 (A) and destination IPmux-24 (B).

   The Manual Circuit Configuration dialog box appears.

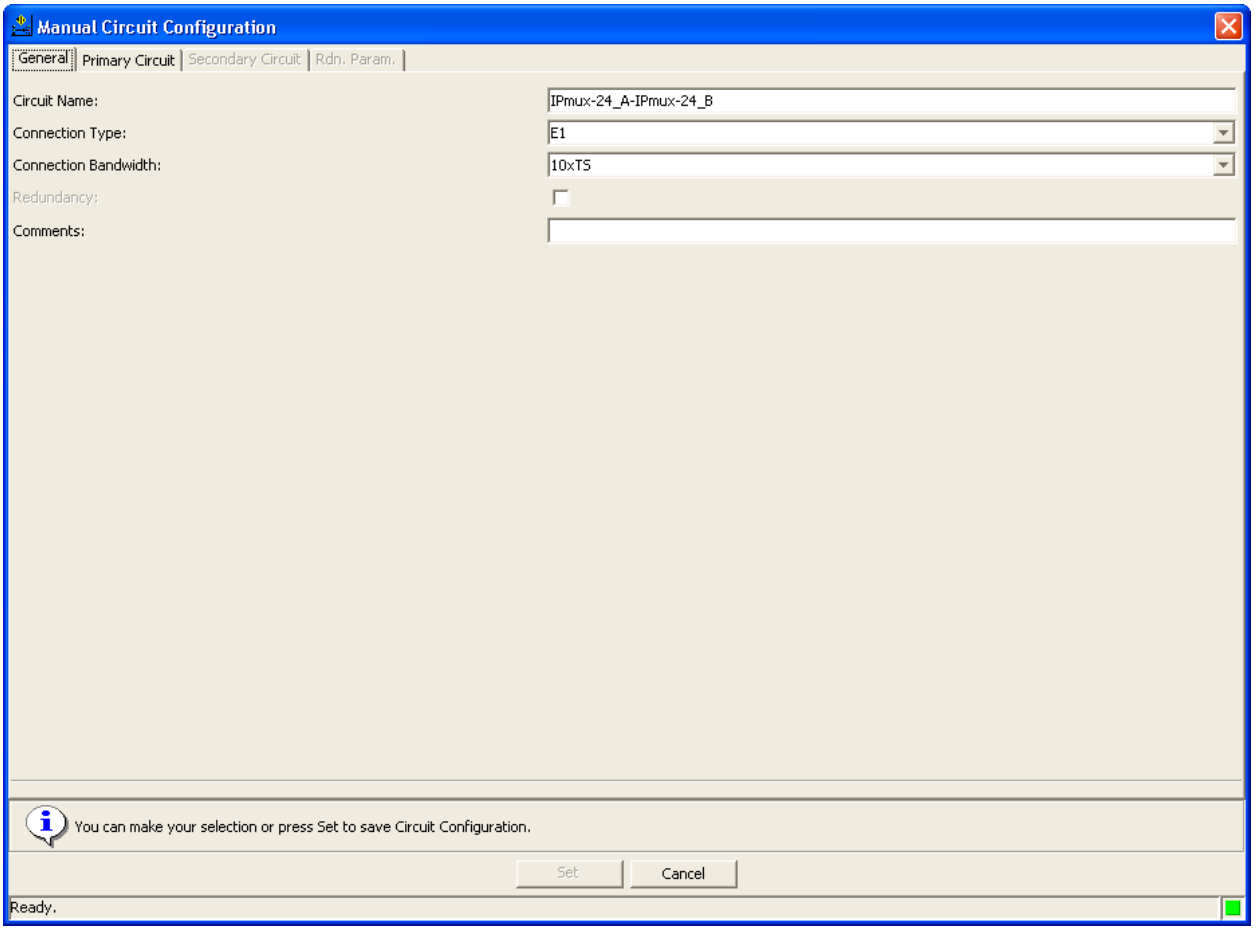

Figure 4-9. Manual Circuit Dialog Box – General Parameters Tab

3. Click on the General tab (*Figure 4-9*) and configure the following parameters:
   - Connection Type = E1
   - Connection Bandwidth = 10xTs
4. Click on the Primary Circuit tab (*Figure 4-9*) and configure the following parameters:
   - Line Type = Framed-CRC
   - TDM Bytes in Frame = 48
   - OAM Connectivity = Enabled (checked).

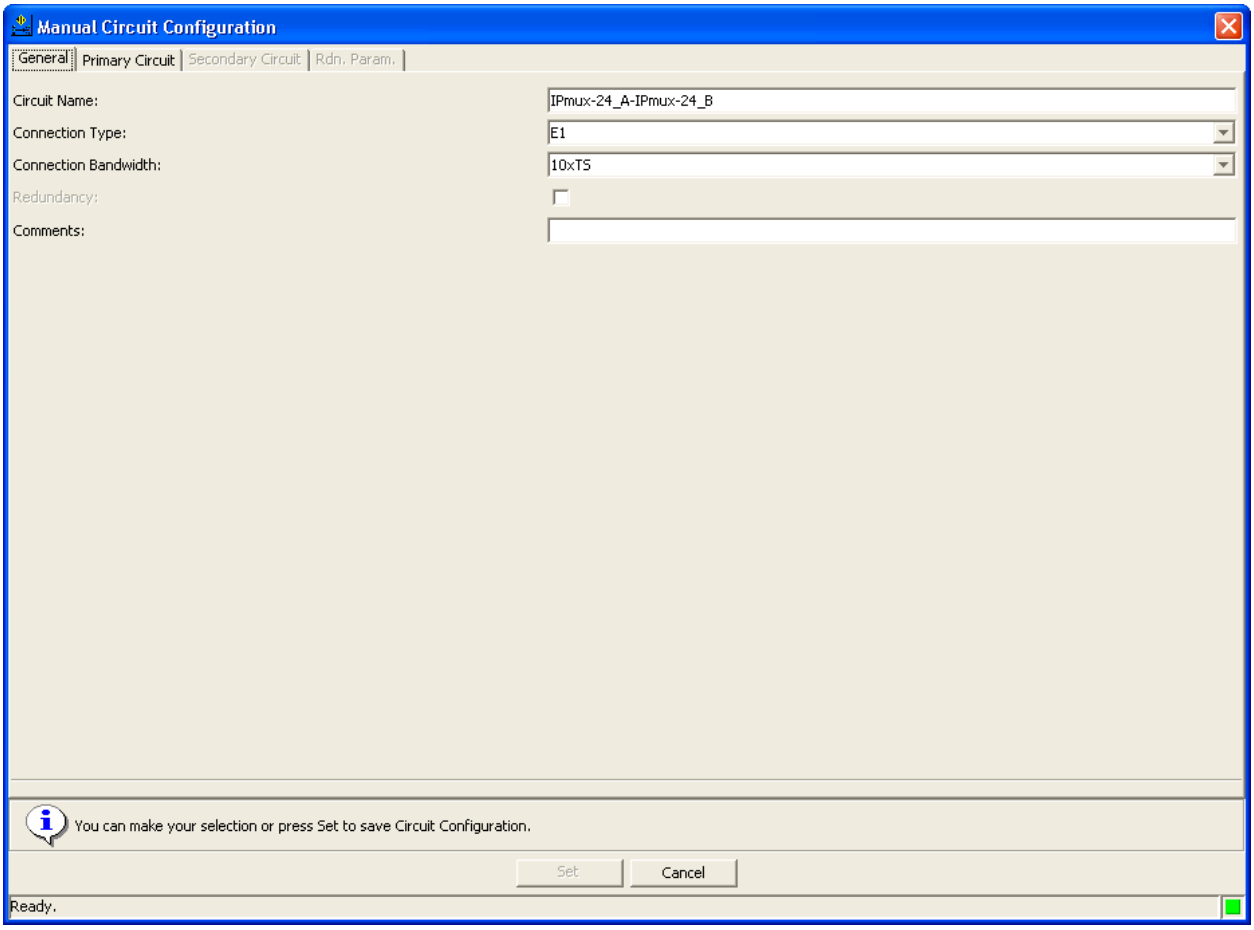

Figure 4-10. Manual Circuit Dialog Box – Primary Circuit Tab

5. Click on the EP Param tab (*Figure 4-11*), scroll down and configure the following parameters:

   - Jitter Buffer = 500.

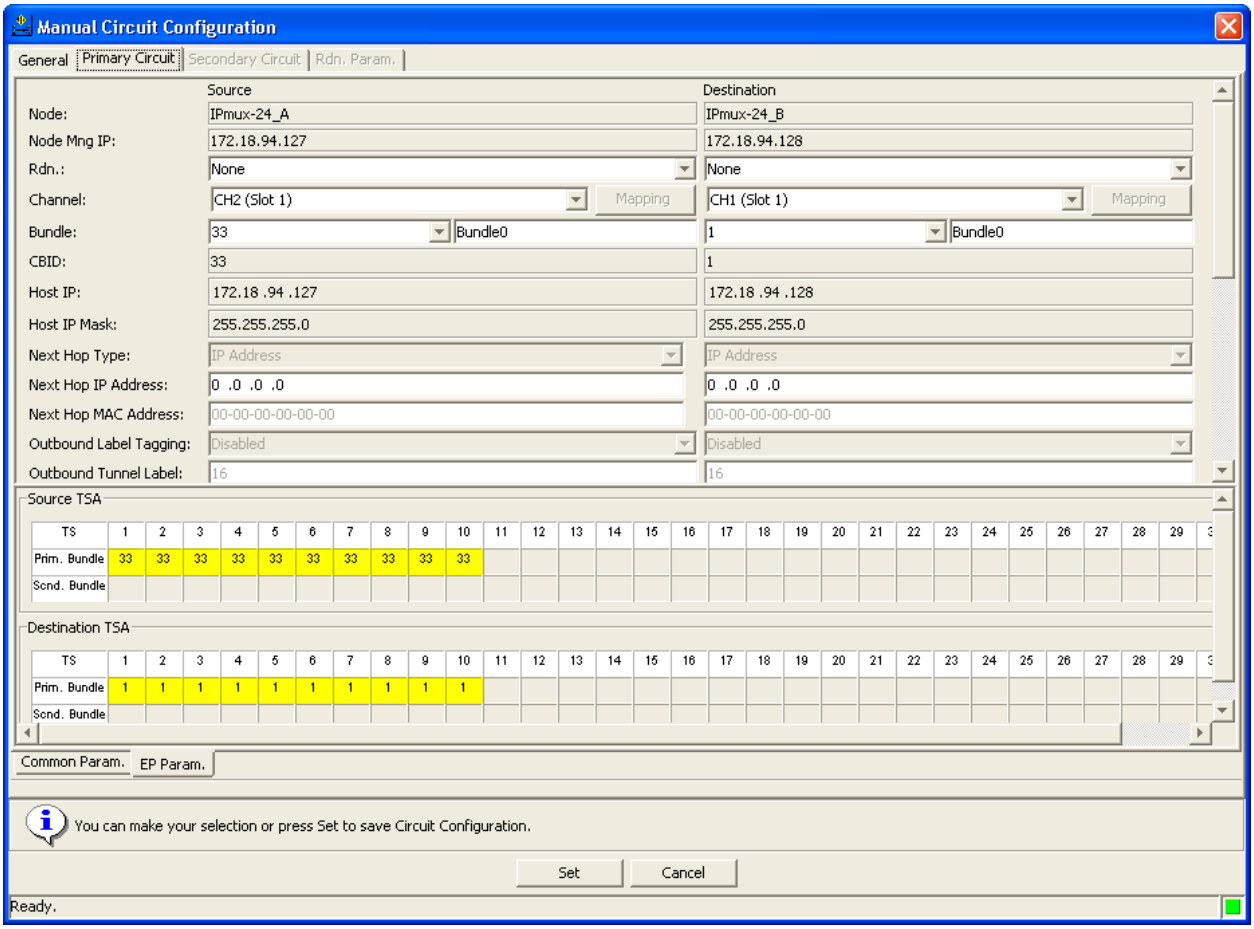

Figure 4-11. Manual Circuit Dialog Box – EP Param Tab

Saving the Circuit Parameters

➤ **To save the circuit parameters:**

1. In the Manual Circuit Dialog Box, click ‹**Set**›.

   A message appears asking you if you want to create another circuit.

2. Click ‹**No**›.

   The circuit is created and appears on the Mesh Services Map.

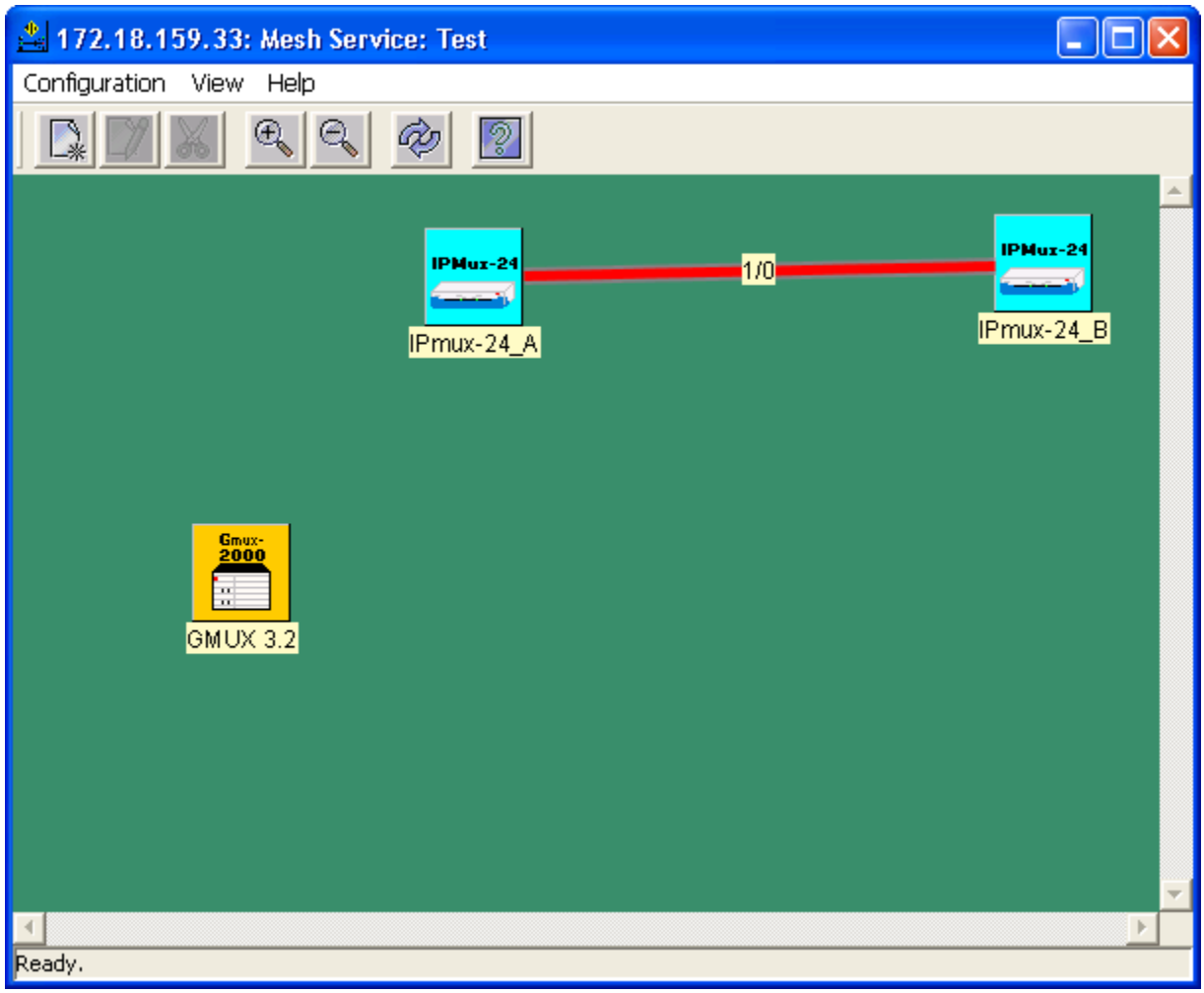

Figure 4-12. Mesh Services Map with Circuit between IPmux-24 (A) and IPmux-24 (B)

Displaying the Circuit Parameters

➤ **To display the circuit parameters:**

1. Click on the link in the Services Map (*Figure 4-12*).
2. Right click and select **Circuit List...**

   The Circuit List appears.

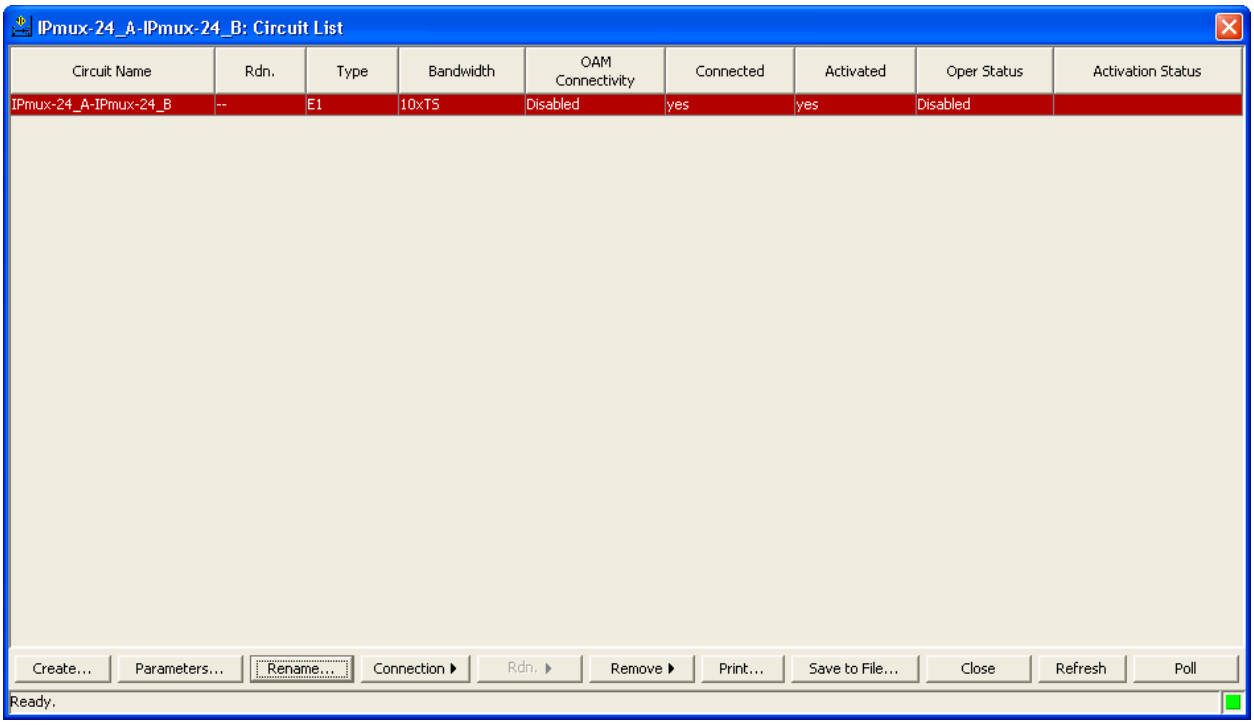

Figure 4-13. Circuit List

3. Click <**Parameters...**>.

   The Manual Circuit Parameters dialog box appears.
4. Verify that the parameters are correct.

Creating a Normal Service Circuit

Normal Services have Branch and Central Sites. Double-clicking on the Branch and Central Sites opens the site windows. In our example, IPmux-24 (A) is located in the central site and IPmux-24 (B) is located in the branch site.

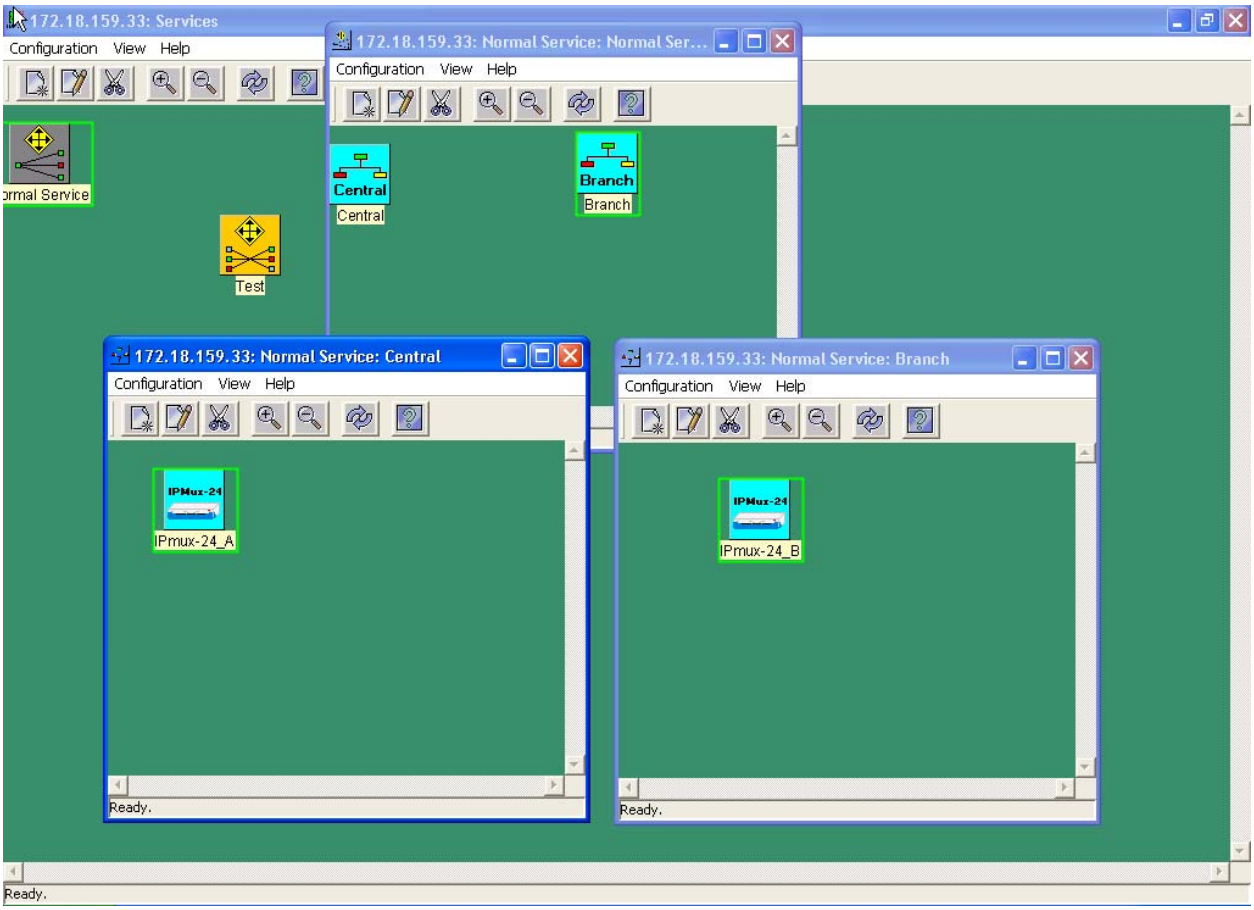

Figure 4-14. Normal Services Map

Defining the E1 Parameters

➤ **To configure the E1 parameters for IPmux-24 (A):**

1. Double click on IPmux-24 (A) at the central site (*Figure 4-14*).

   The Element Manager appears.

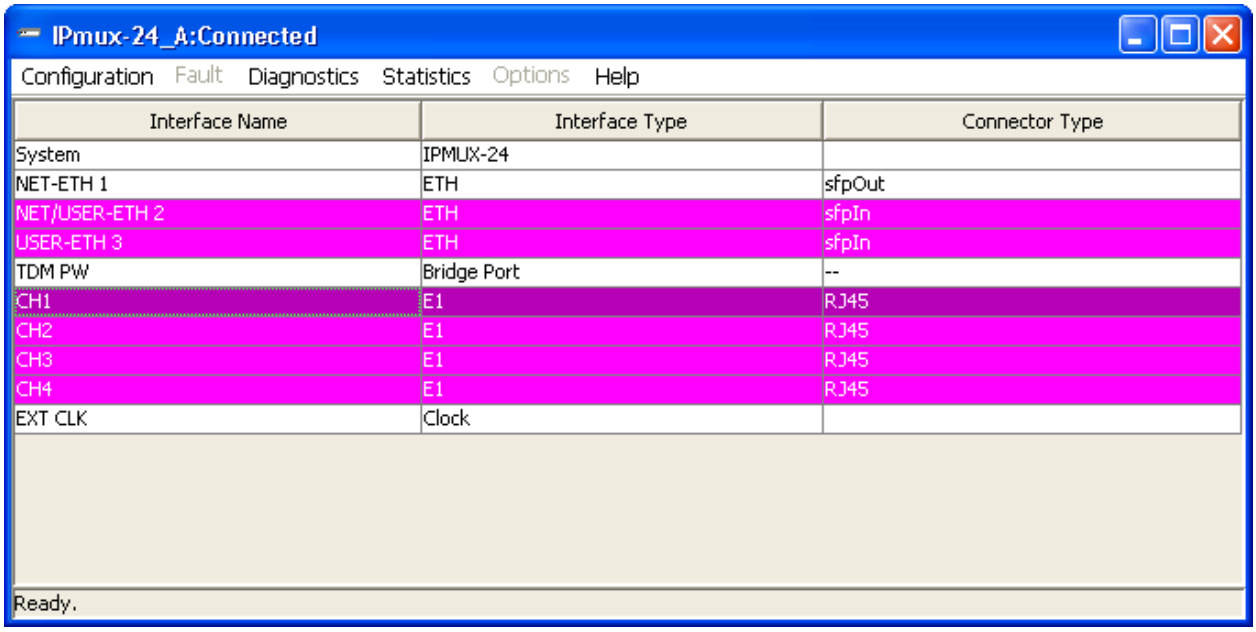

Figure 4-15. IPmux-24 (A) Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-6*).
4. Select the following parameters:
   - Transmit Clock Source = Adaptive
   - Line Type = Framed-CRC.
5. Click ‹**Set**›.

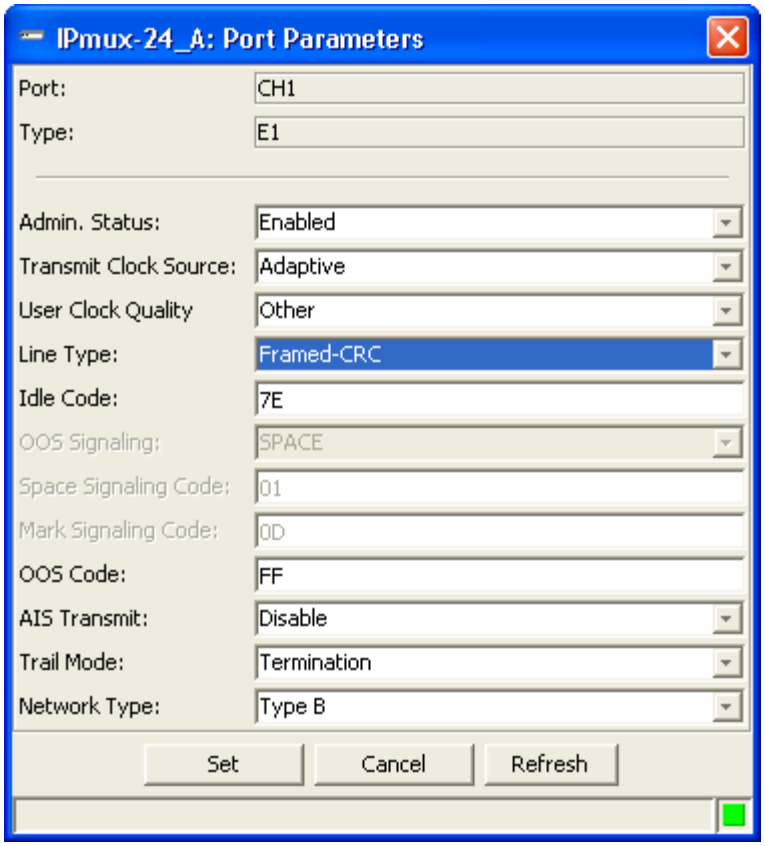

Figure 4-16. IPmux-24 (A) E1 Interface Parameters

➤ **To configure E1 parameters for IPmux-24 (B):**

1. Double click on IPmux-24 (B) at the branch site (*Figure 4-14*).

   The Element Manager appears.

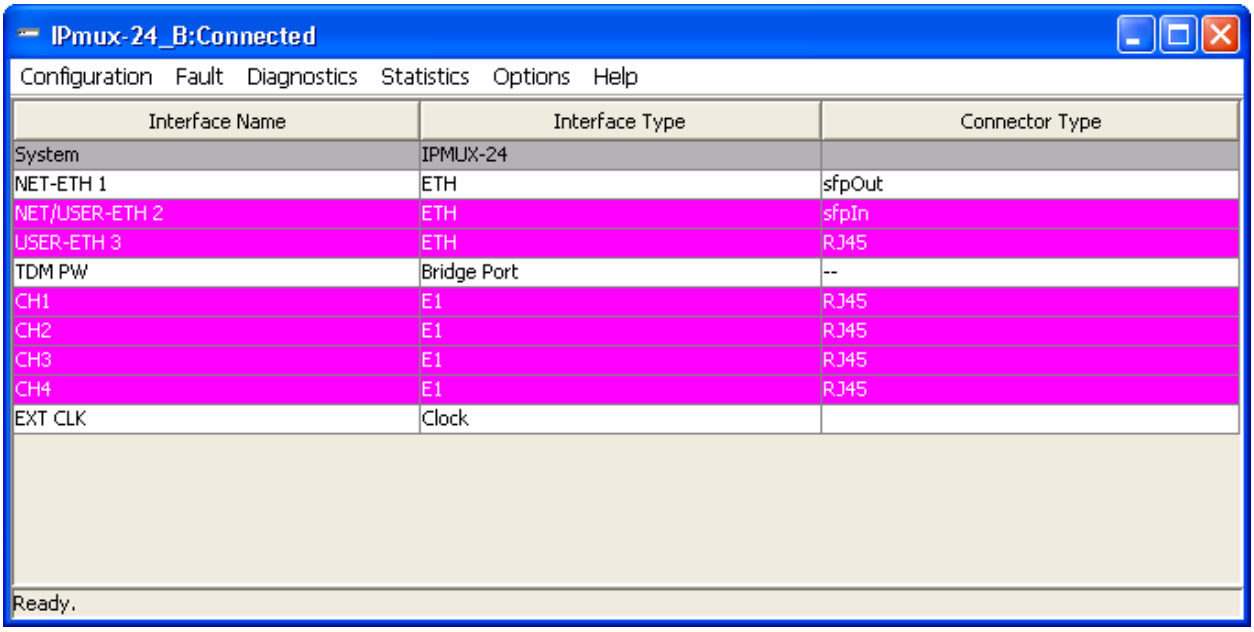
IPmux-24_B:Connected
Configuration Fault Diagnostics Statistics Options Help
Interface Name | Interface Type | Connector Type
System | IPMUX-24 |
NET-ETH 1 | ETH | sfpOut
NET/USER-ETH 2 | ETH | sfpIn
USER-ETH 3 | ETH | RJ45
TDM PW | Bridge Port | --
CH1 | E1 | RJ45
CH2 | E1 | RJ45
CH3 | E1 | RJ45
CH4 | E1 | RJ45
EXT CLK | Clock |
Ready.

Figure 4-17. IPmux-24 (B) Element Manager

2. Select CH1.

3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-8*).

4. Select the following parameters:
   - Transmit Clock Source = Loopback
   - Line Type = Framed-CRC.
5. Click ‹**Set**›.

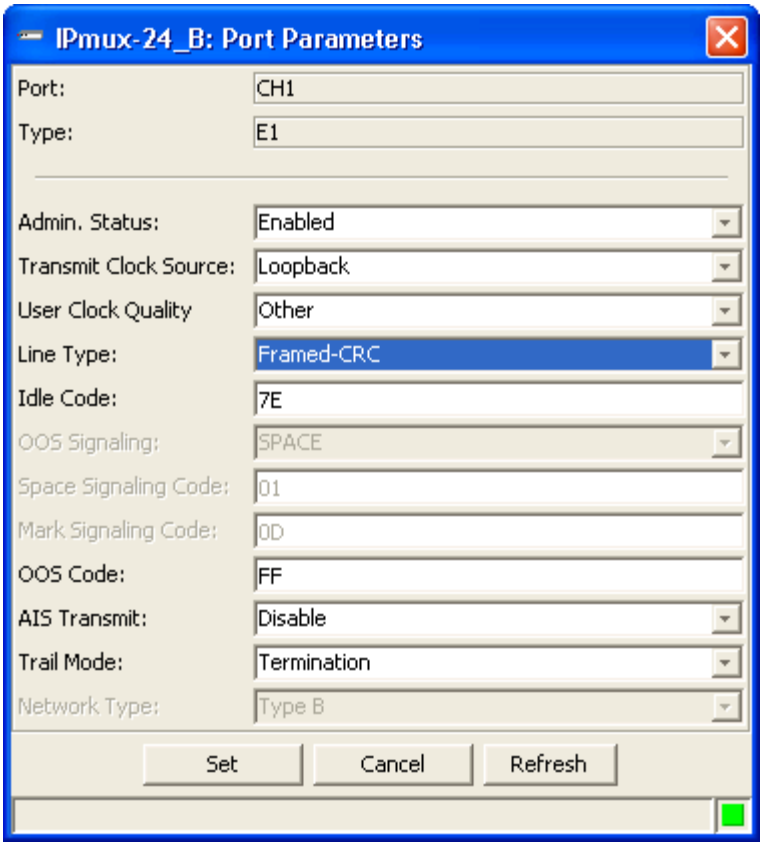

Figure 4-18. IPmux-24 (B) E1 Interface Parameters

Creating a Circuit

➤ **To create a circuit between IPmux-24 (A) and IPmux-24 (B:**

1. On the Central Site, select the source for the circuit. In this example it is the IPmux-24 (A).
2. While holding down the CTRL key, right click the mouse and drag a line between IPmux-24 (A) and IPmux-24 (B).

   A circuit is created between the two sites and appears with a dotted line.

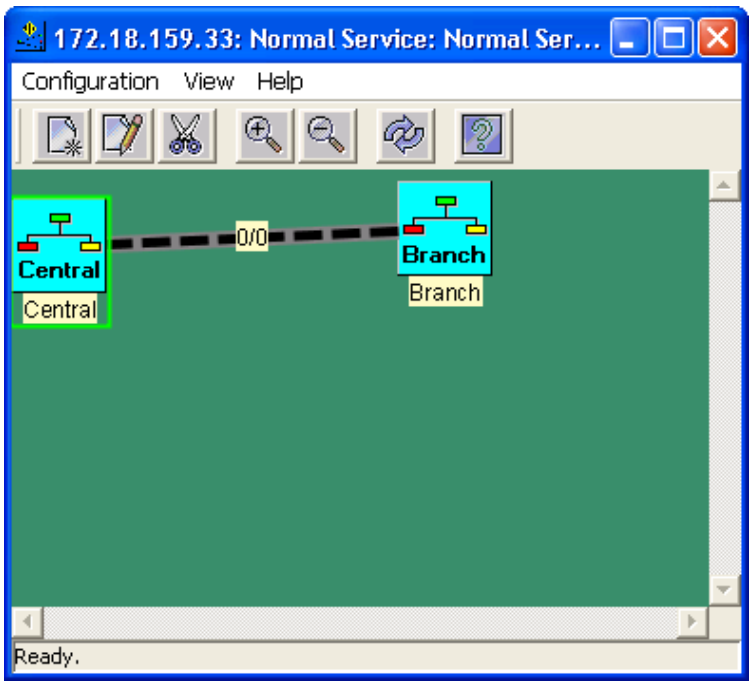

Figure 4-19. Normal Services Circuit Creation

➤ **To configure circuit parameters:**

1. Select the circuit by clicking on its line in the Normal Services Map.
2. Right click and select **Circuit List...**

   The Circuit List dialog box appears.

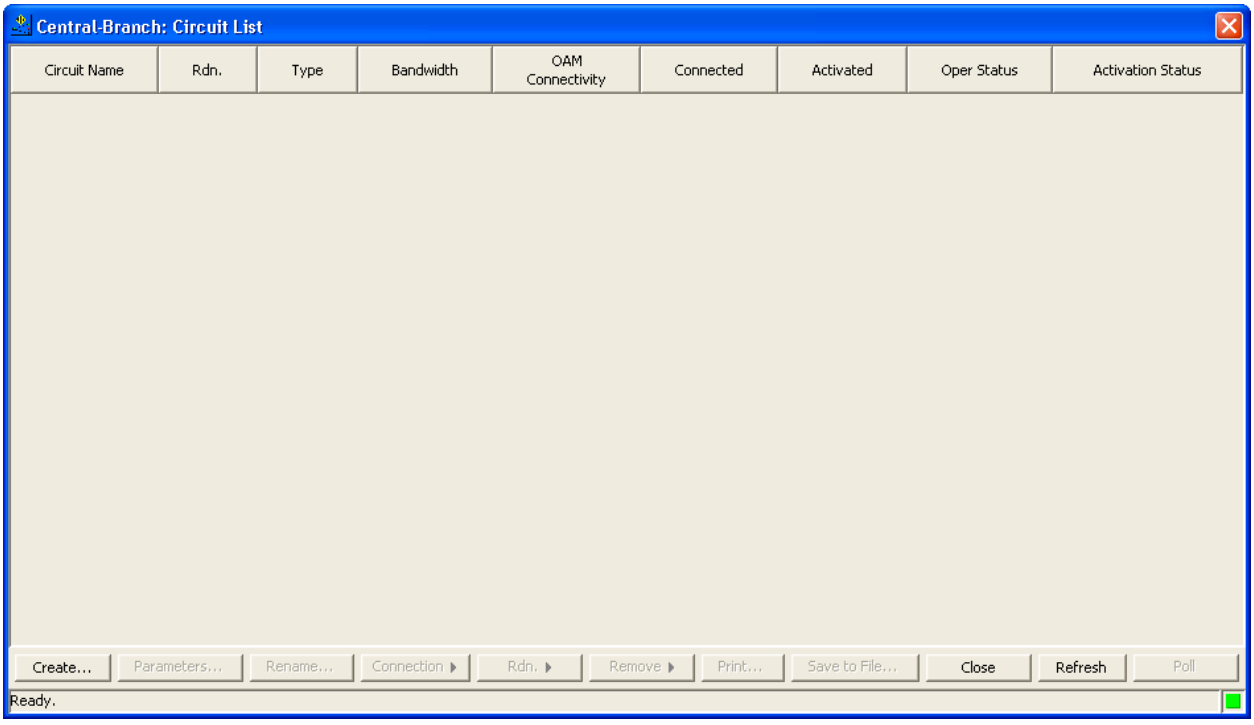

Figure 4-20. Circuit List

3. Click <**Create...**>.

   The Manual Circuit Configuration dialog box appears.

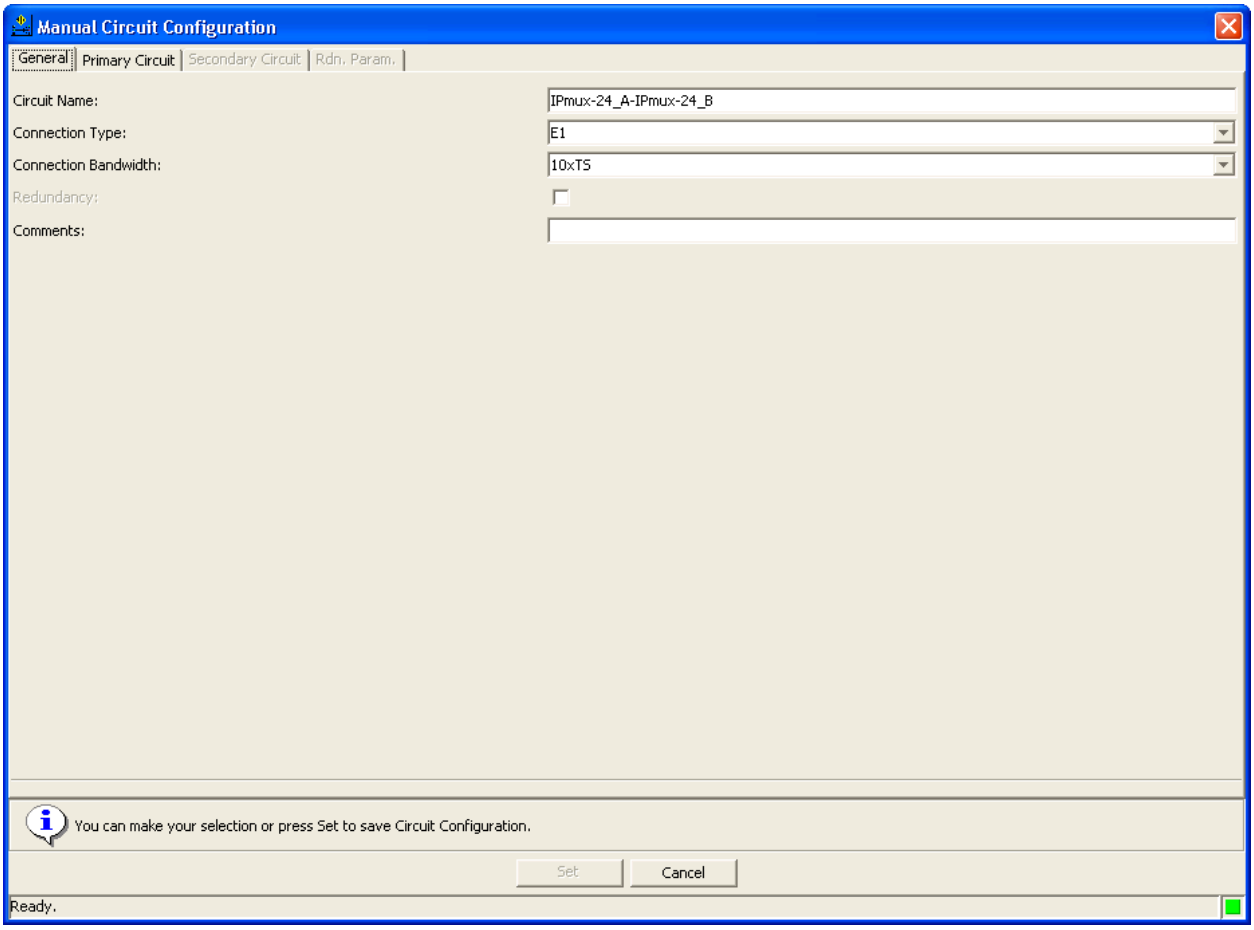

Figure 4-21. Manual Circuit Dialog Box – General Parameters Tab

4. Click on the General tab (*Figure 4-21*) and configure the following parameters:
   - Connection Type = E1
   - Connection Bandwidth = 10xTs.
5. Click on the Primary Circuit tab (*Figure 4-22*) and configure the following parameters:
   - Line Type = Framed-CRC
   - TDM Bytes in Frame = 48
   - OAM Connectivity = Enabled (checked).
6. Select Central and Branch Sites.

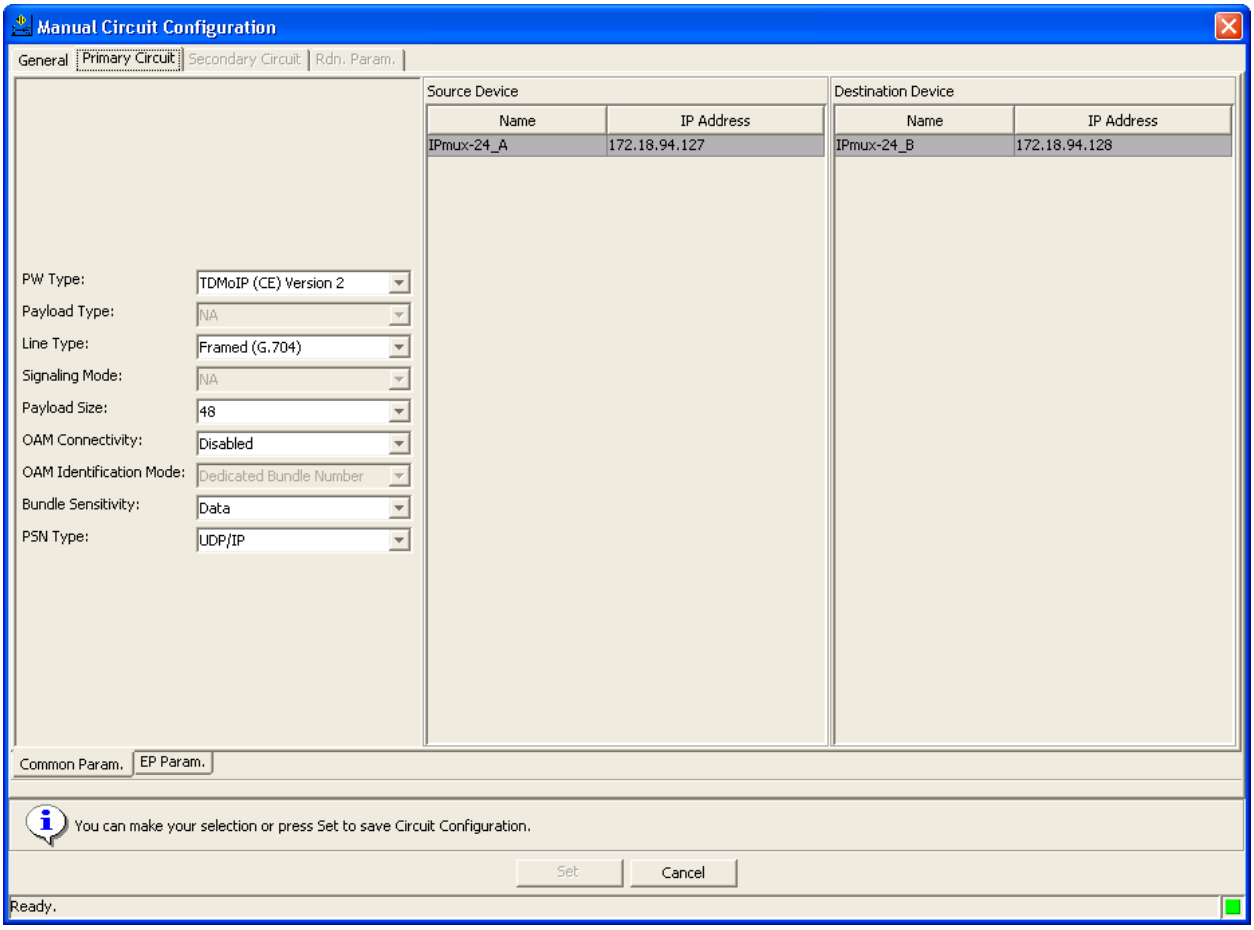

Figure 4-22. Manual Circuit Dialog Box – Primary Circuit Tab

7. Click on the EP Param tab (*Figure 4-23*) and configure the following parameters:
   - Jitter Buffer = 500.

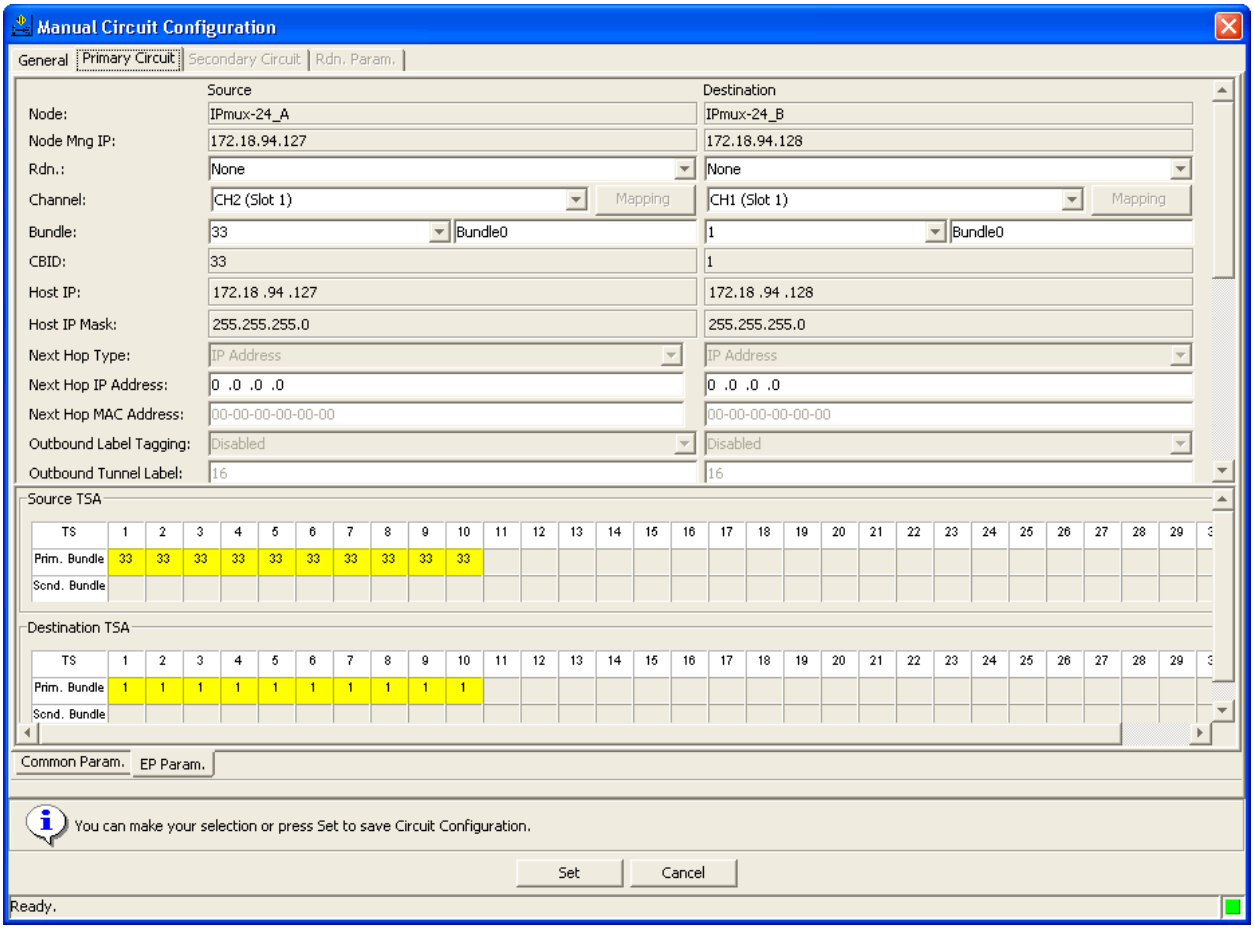

Figure 4-23. Manual Circuit Dialog Box – EP Param Tab

Saving the Circuit Parameters

➤ **To save the circuit parameters:**

1. In the Manual Circuit Dialog Box, click <**Set**>.

   A message appears asking you if you want to create another circuit.

2. Click <No>.

   The circuit is created and appears on the Normal Services Map.

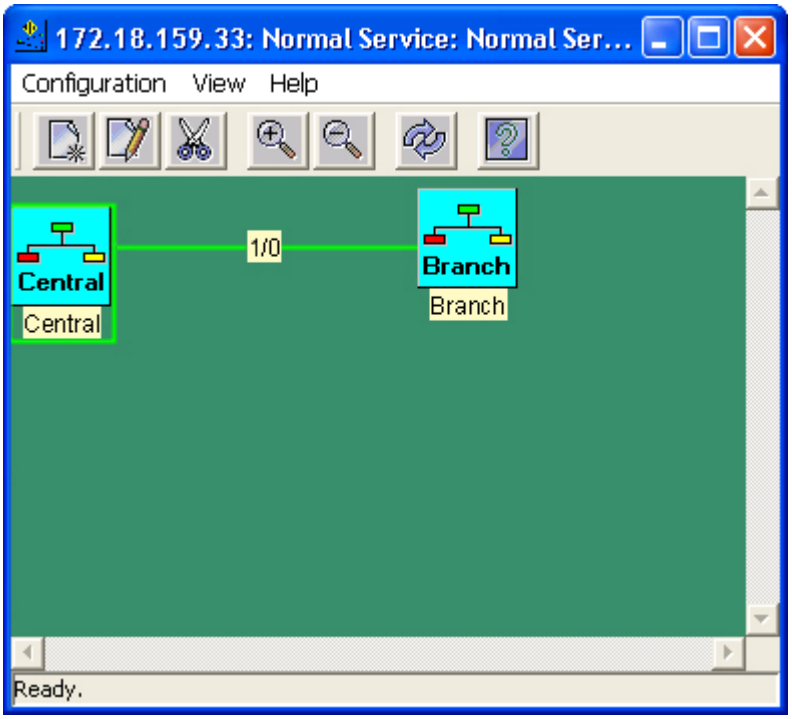

Figure 4-24. Normal Service with Circuit

Displaying the Circuit Parameters

➤ **To display the circuit parameters:**

1. Click on the link in the Services Map (*Figure 4-24*).
2. Right click and select **Circuit List...**

   The Circuit List appears.

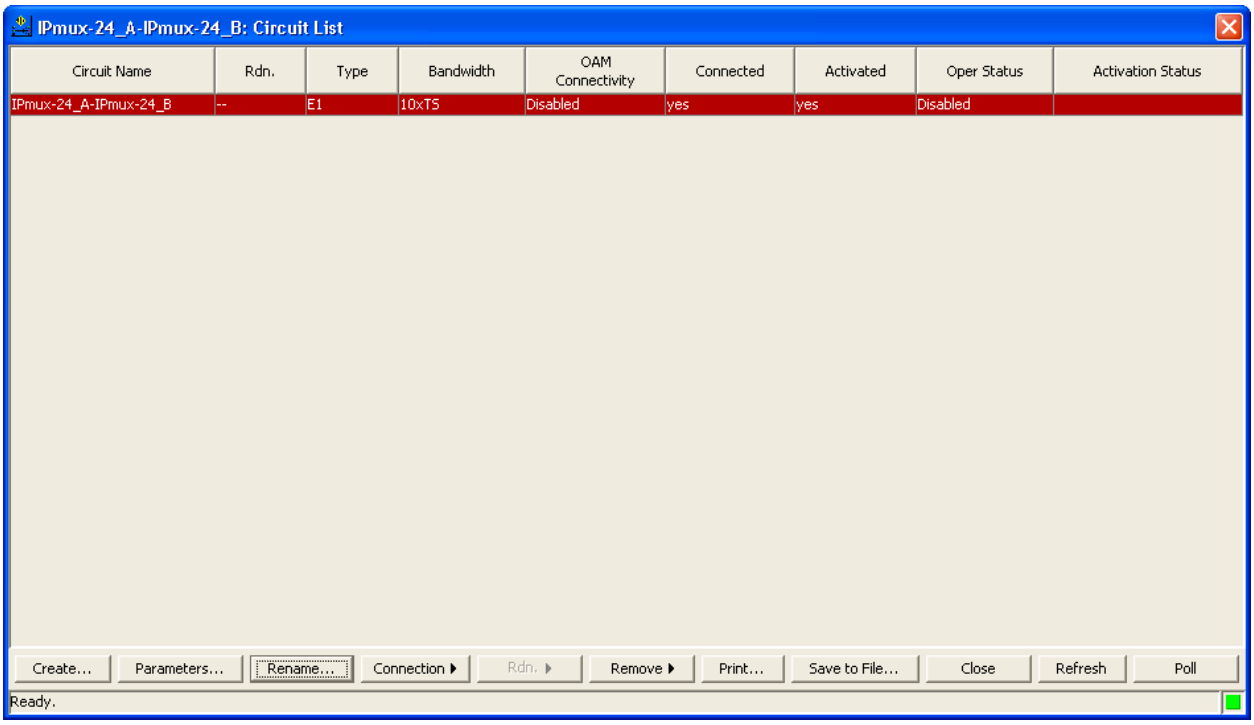

Figure 4-25. Circuit List

3. Click ‹Parameters...›

   The Manual Circuit Parameters dialog box appears.
4. Verify that the parameters are correct.

Chapter 5

Security Management

This chapter discusses how to manage IPmux-24 security, and includes the following sections:

- *Setting Management Access Authorizations*
- *Unix Users and Permissions.*

5.1 Setting Management Access Authorizations

The **Access** command allows you to enable or disable management via Telnet and Web access. Use this command to tighten security or to enable access, when necessary.

➤ **To enable or disable Telnet and Web access:**

1. Select **Options > Access...**.

   The Access dialog box appears (*Figure 5-1*).

2. Configure Telnet and Web access and click <**Set**>.

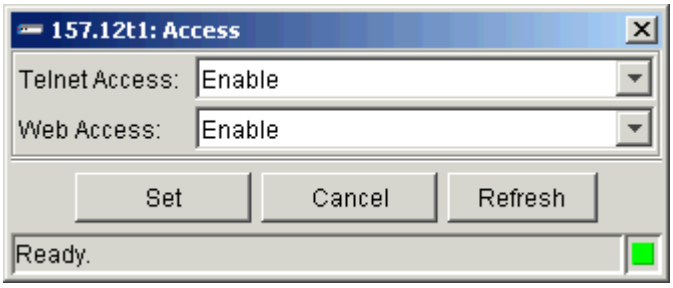

Figure 5-1. Access Dialog Box

Table 5-1. Telnet and Web Access Parameters

Parameter	Possible Values/Remarks
Telnet Access	Enable/Disable accessing the device via Telnet **Disable** - No one is allowed to access the device via Telnet. **Enable** - All users are allowed to access the device via Telnet Access. **Managers Only** - Only manager stations listed in the manager's list are allowed to access the device via Telnet. **Secured Mode Only** - All users are allowed to access the device via Telnet Access and only Secure data is accepted. **Secured Mode Manager List Only** - Only manager stations listed in the manager's list are allowed to access the device via Telnet and only Secure data is accepted. ***Note:*** *Secured Mode Only and Secured Mode Manager List Only are only available for IPmux-14/24.*
Web Access	Enable/Disable accessing the device via Web browser **Disable** - No one is allowed to access the device via Web. **Enable** - All users are allowed to access the device via Web. **Managers Only** - Only manager stations listed in the manager's list are allowed to access the device via Web. **Secured Mode Only** - All users are allowed to access the device via Telnet Access and only Secure data is accepted. **Secured Mode Manager List Only** - Only manager stations listed in the manager's list are allowed to access the device via Telnet and only Secure data is accepted.

5.2 Unix Users and Permissions

RADview/HPOV, when running on a Unix-based operating system, supports the users and permissions security feature. Only an Administrator can add or remove nodes from the Service Center map. For further details, refer to the RADview-SC/TDMoIP system manual.

Chapter 6

Performance Management

This chapter discusses how to monitor IPmux-24 performance.

6.1 Introduction

IPmux-24 continuously collects performance statistics for its various ports and for bundle connections. The collected data enables network administrators to monitor the transmission performance, and thus the quality of service provided to users.

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. RADview can also display Current Statistics, information and graphs displaying a more immediate view of the statistics counters. The Current Statistics window is refreshed periodically, according to the Polling Interval, or manually, whenever you click the **<Poll>** button.

This chapter explains how to perform the following tasks:

- *Setting the Polling Interval*
- *Viewing Bundle Statistics*
- *Viewing HDLC Statistics*
- *Viewing Bundle Current Statistics*
- *Viewing Bundle Intervals Statistics*
- *Viewing E1/T1 Port Current Statistics*
- *Viewing Port Intervals Statistics*
- *Viewing Ethernet Port Statistics.*

6.2 Setting the Polling Interval

RADview updates displayed statistical data by polling IPmux-24 at set intervals. The Polling Interval command allows you to set the number of seconds between polls.

➤ **To set the polling interval:**

- Select **Statistics > Polling Interval...**.

  The Polling Interval dialog box appears.

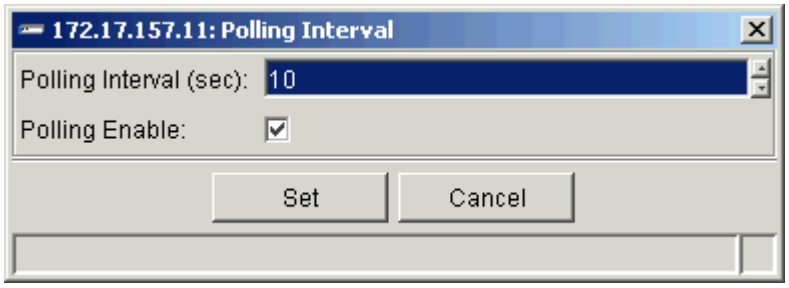

Figure 6-1. Polling Interval

Table 6-1. Polling Interval

Parameter	Possible Values / Remarks
Polling Interval (sec)	Number of seconds between polls
Polling Enable	Selecting the checkbox enables polling when a Statistics dialog box is open. After each poll, RADview automatically updates the information in the dialog box. If polling is disabled, RADview does not automatically update a Statistics dialog box. ***Note:*** *Polling is always enabled when a Statistics graph is open.*
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.

6.3 Viewing Bundle Statistics

The **Bundle Connection Statistics** command enables you to view statistics for all bundle connections. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To display Bundle Connection Statistics:**

- Select **Statistics > Bundle Statistics...**.

  The Bundle Statistics dialog box appears.

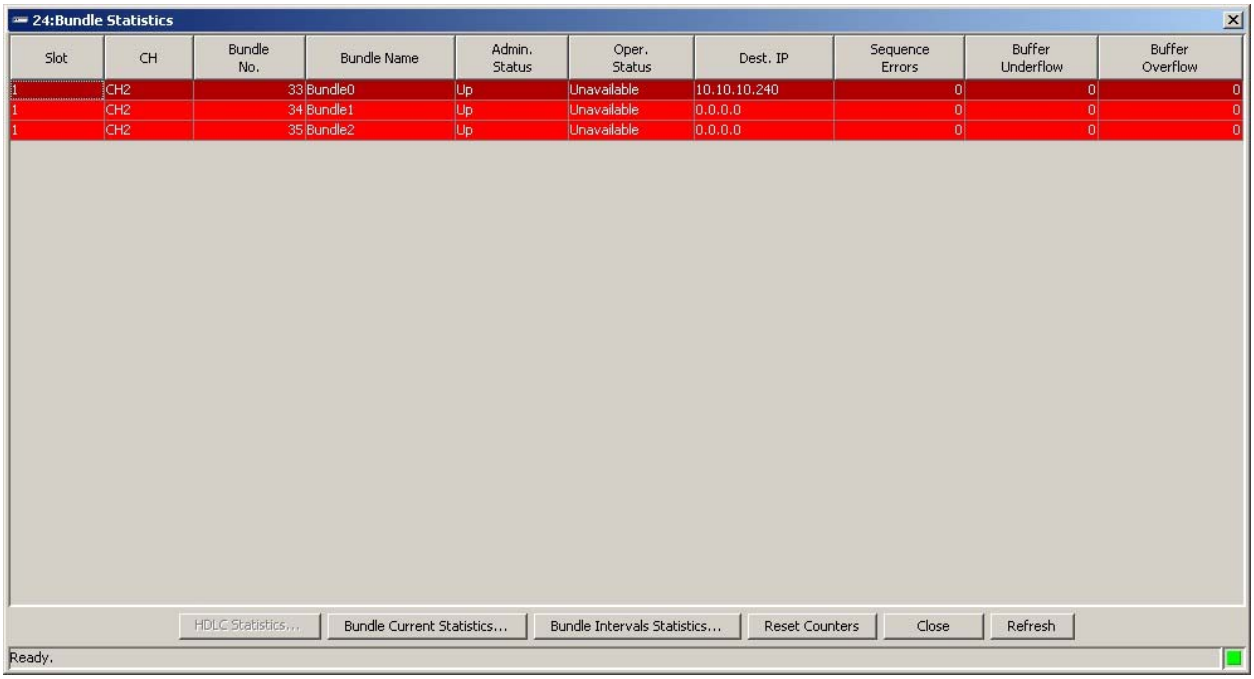

Figure 6-2. Bundle Statistics

Table 6-2. Bundle Statistics

Parameter	Possible Values / Remarks
Slot	1
CH	CH1..CH4
Bundle No.	1..496
Bundle Name	Bundle name for selected channel. Table will display one bundle name per line.
Admin. Status	Desired state of the link Down, Up
Oper. Status	Actual state of the link Connected, Remote Fail, Local Fail, Disabled, Unavailable, Validation Fail, Sequence Error, Buffer Underflow, Buffer Overflow
Dest. Name	Logical name or IP address of the destination IPmux

Parameter	Possible Values / Remarks
Sequence Errors (sec)	Number of seconds that the sequence number of an incoming frame caused a transition from the 'sync' state to the 'out of sequence' state. Out of sequence frames are dropped because the frames were received from the network with Sequence Numbers not equal to the last Sequence Number + (1 or 2).
Buffer Underflow (sec)	Number of seconds that the receive (Eth to TDM) buffer underflowed. When a continuous underflow is caused by a loss of frame flow, a single buffer underflow is counted. A buffer undeflow indicates that frames were dropped because the receive buffer was in an underrun state. The buffer enters underflow state when: • Sequence errors occur • Flow underrun takes place due to PDV expiration • An overflow condition occurs.
Buffer Overflow (sec)	Number of seconds that the receive (Eth to TDM) buffer overflowed. A buffer overflow indicates that frames were dropped because the receive buffer exceeded the maximum allowed depth.
PSN Sequence Errors	Number of times that the sequence number of an incoming frame indicated Loss of Frame or that Out of Order occurred in the PSN
PSN Reordered frames	Number of times that Frames had been reordered in the PSN
[HDLC Statistics]	Click to view HDLC statistics.
[Bundle Current Statistics...]	Click to view Bundle Current statistics.
[Bundle Intervals Statistics...]	Click to view Bundle Intervals statistics.
[Reset Counters]	Select a row in the table and click **‹Reset Counters›** to reset the Bundle Connection Statistics Counters.
[Close]	Click to close the Bundle Statistics window.
[Refresh]	Click to refresh the information in the Bundle Statistics window.

6.4 Viewing HDLC Statistics

➤ **To view the HDLC Table:**

1. Select **Statistics > Bundle Connection Statistics...**
   The Bundle Statistics dialog box appears (*Figure 6-2)*.
2. Select the bundle for which you wish to display the statistics.
3. Click <**HDLC Statistics...**>.
   The Bundle HDLC Statistics dialog box appears (see *Figure* 6-4).

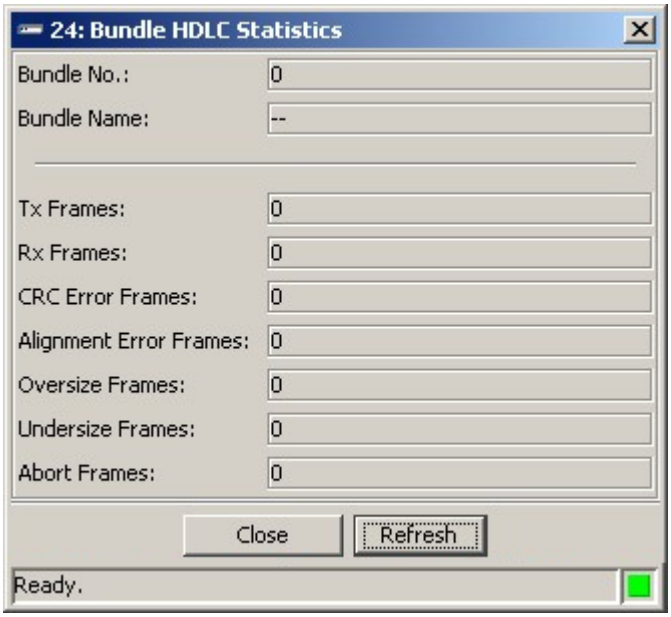

Figure 6-3. Bundle HDLC Statistics Dialog Box

Table 6-3. Bundle HDLC Statistics Parameters

Parameter	Remarks
Bundle No.	The number of the selected bundle. Read only
Bundle Name	Bundle name for selected channel . Read only
Tx Frames	Number of HDLC frames that were transmitted. Read only
Rx Frames	Number of HDLC frames that were received. Read only
CRC Error Frames	Number of received HDLC frames with CRC errors. Read only
Alignment Error Frames	Number of received HDLC frames with alignment errors. Read only

Parameter	Remarks
Oversize Frames	Number of HDLC frames received which are longer than 1470. Read only
Undersize Frames	Number of HDLC frames received which are shorter than 4. Read only
Abort Frames	Number of HDLC frames received with abort indication. Read only
[Close]	Click to close the Bundle HDLC Statistics dialog box.
[Refresh]	Click to refresh the information in the Bundle HDLC Statistics dialog box.

6.5 Viewing Bundle Current Statistics

The **Bundle Current Statistics** command enables you to view current statistics for the selected bundle connection. Statistics are displayed in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view the Bundle Current Table:**

1. Select **Statistics › Bundle Connection Statistics...**.

   The Bundle Statistics dialog box appears (*Figure 6-2)*.

2. Select the bundle for which you wish to display the statistics.
3. Click ‹**Bundle Current Statistics...**›.

   The Bundle Current Statistics dialog box appears.

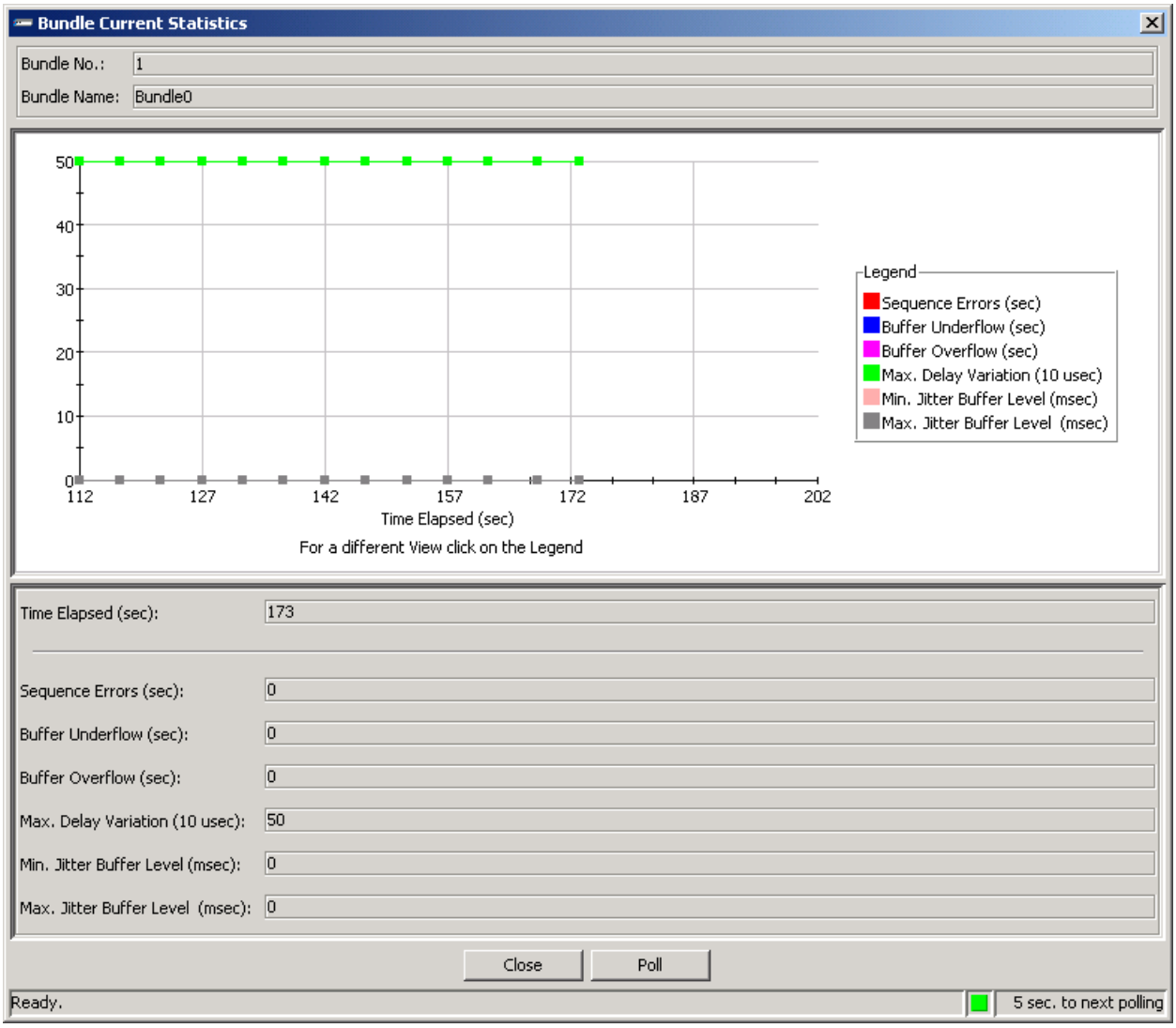

Figure 6-4. Bundle Current Statistics

Table 6-4. Bundle Current Statistics Parameters

Parameter	Remarks
Bundle No.	For E1: **1** to **496** For T1: **1** to **384**
Bundle Name	Bundle name for selected channel
Time Elapsed (sec)	Amount of time that has passed since the beginning of the current 15-minute interval **0..899**
Sequence Errors (sec)	Number of seconds in the current interval that the sequence number of an incoming frame caused a transition from the 'sync' state to the 'out of sequence' state. Out of sequence frames are dropped because the frames were received from the network with Sequence Numbers not equal to the last Sequence Number + (1 or 2).

Parameter	Remarks
Buffer Underflow (sec)	Number of seconds in the current interval that the receive (Eth to TDM) buffer underflowed. When a continuous underflow is caused by a loss of frame flow, a single buffer underflow is counted. A buffer undeflow indicates that frames were dropped because the receive buffer was in an underrun state. The buffer enters underflow state when: • Sequence errors occur • Flow underrun takes place due to PDV expiration • An overflow condition occurs
Buffer Overflow (sec)	Number of seconds in the current interval that the receive (Eth to TDM) buffer overflowed. A buffer overflow indicates that frames were dropped because the receive buffer exceeded the maximum allowed depth.
Max. Delay Variation (10 µsec)	Maximum size of the buffer (in 10s of µsec) in the selected interval ***Note:*** *This parameter is used for a CES E1/T1 card whose hardware version is greater than 5.00.*
Min Jitter Buffer Level (msec)	Minimum jitter buffer level (in msec) for the current interval
Max Jitter Buffer Level (msec)	Maximum jitter buffer level (in msec) for the current interval
[Close]	Click to close the Bundle Current Statistics dialog box.
[Poll]	Click to refresh the data in the Bundle Current Statistics dialog box.

6.6 Viewing Bundle Intervals Statistics

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. The **Bundle Intervals Statistics** command displays intervals statistics for the selected bundle connection, in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view a list of statistics from previous intervals:**

1. Select **Statistics > Bundle Connection Statistics...**.

   The Bundle Statistics dialog box appears (*Figure 6-2)*.

2. Select the bundle for which you wish to display the statistics.
3. Click <**Bundle Intervals Statistics...**>.

   The Bundle Intervals Statistics dialog box appears.

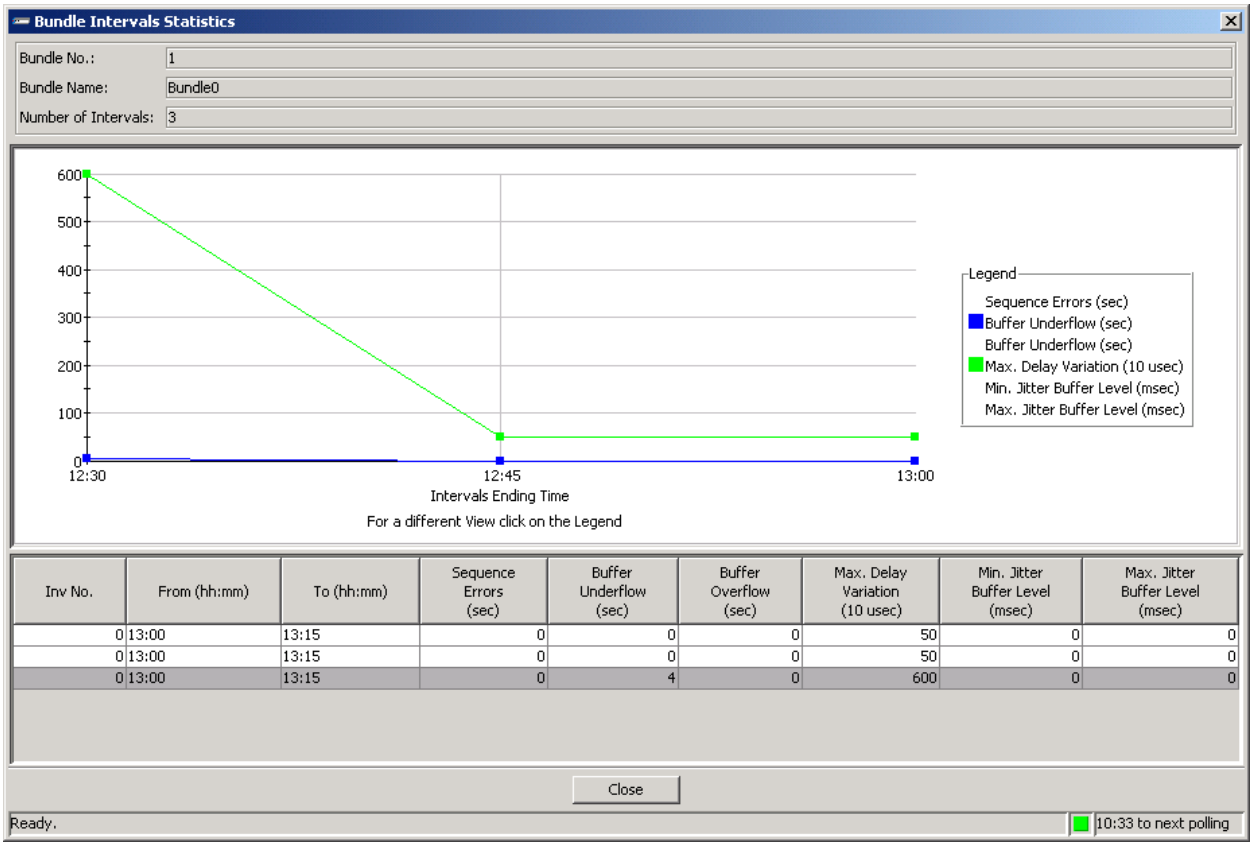
Bundle Intervals Statistics
Bundle No.: 1
Bundle Name: Bundle0
Number of Intervals: 3
600
500
400
300
200
100
0
12:30
12:45
13:00
Intervals Ending Time
For a different View click on the Legend
Legend
Sequence Errors (sec)
Buffer Underflow (sec)
Buffer Underflow (sec)
Max. Delay Variation (10 usec)
Min. Jitter Buffer Level (msec)
Max. Jitter Buffer Level (msec)
Inv No. | From (hh:mm) | To (hh:mm) | Sequence Errors (sec) | Buffer Underflow (sec) | Buffer Overflow (sec) | Max. Delay Variation (10 usec) | Min. Jitter Buffer Level (msec) | Max. Jitter Buffer Level (msec)
0 | 13:00 | 13:15 | 0 | 0 | 0 | 50 | 0 | 0
0 | 13:00 | 13:15 | 0 | 0 | 0 | 50 | 0 | 0
0 | 13:00 | 13:15 | 0 | 4 | 0 | 600 | 0 | 0
Close
Ready.
10:33 to next polling

Figure 6-5. Bundle Intervals Statistics

The Bundle Intervals Data parameters are the same as the Bundle Current Data Parameters (*Table 6-4*) with the addition of information regarding Interval No. and its duration.

6.7 Viewing E1/T1 Port Current Statistics

The **Current** statistics command enables you to view current statistics for the selected E1 or T1 port. Statistics are displayed in both table and graph forms. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view a list of current error statistics for an E1/T1 port:**

1. Click an E1/T1 port.
2. Select **Statistics › Current...**

   The Port Current Statistics dialog box appears.

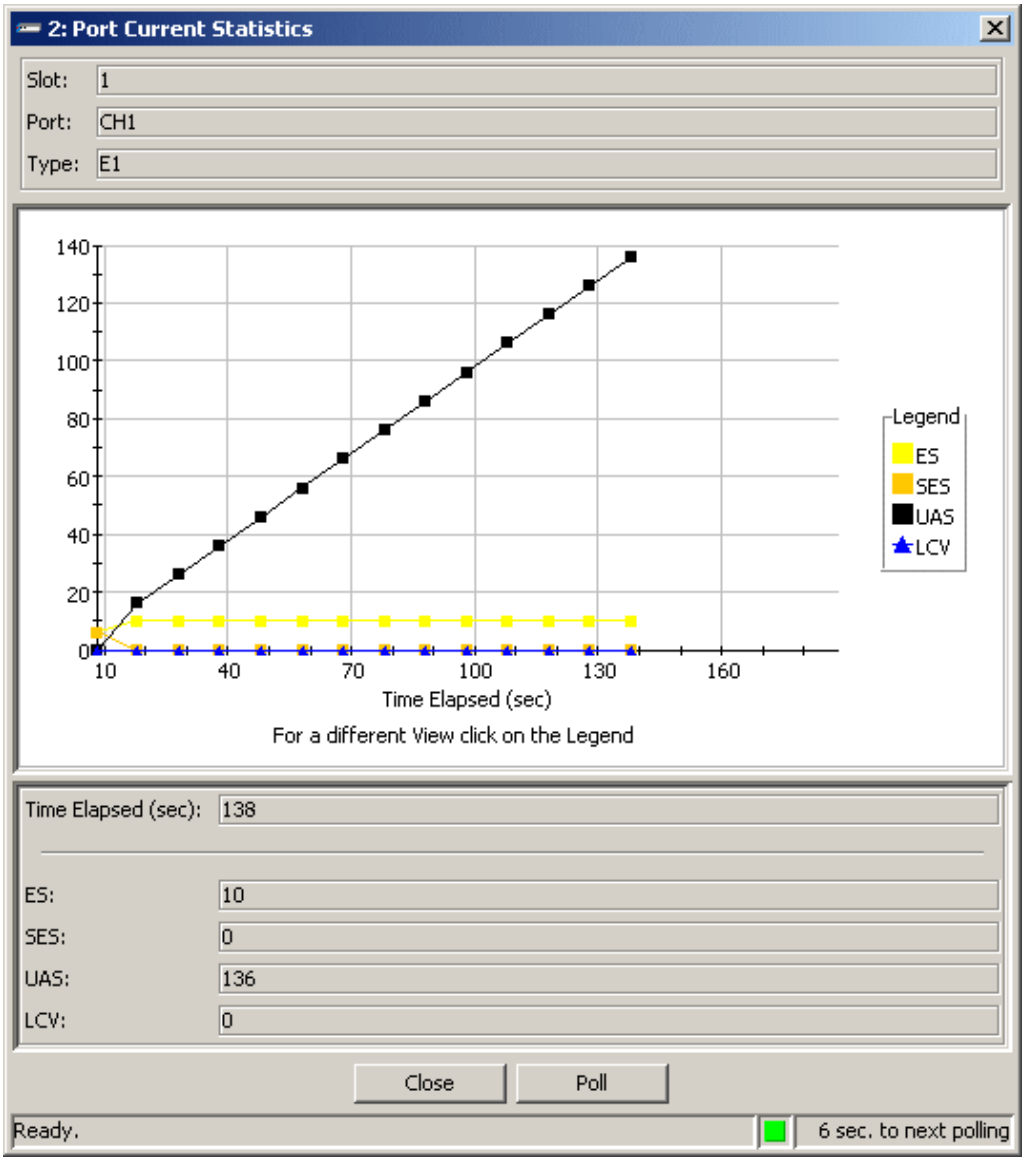

Figure 6-6. Port Current Statistics

Table 6-5. Port Current Statistics Parameters – E1/T1

Parameter	Remarks
Slot	**1**
Port	**CH1..CH4**
Type	**E1, T1**
Current Data	Each parameter displays the number of seconds of that particular type of error encountered by the E1/T1 interface during the current 15-minute interval
Time Elapsed (sec)	Amount of time that has passed since the beginning of the current 15-minute interval **0..899**

Parameter	Remarks
ES	Errored Seconds A second containing one or more of the following events: CRC error, SEF (OOF), or AIS. *Note:* • *An OOF defect is the occurrence of a framing bits error.* *If SES also occurs at the same time, ES will stop after 10 seconds.*
SES	Severely Errored Seconds 320 or more CRC error events, one or more SEF (OOF), or AIS. OOF defect indicates a framing bits error.
UAS	Unavailable Seconds Number of seconds that the interface is unavailable. The system is unavailable after 10 continuous SES.
LCV	Line Code Violations **For T1**: The sum of BPV and EXZ defects that occurred in a second. BPV is the occurrence of a zero string greater than 15 (for AMI) or 7 (for B8ZS). EXZ is the occurrence of a pulse of the same polarity as the previous pulse. **For E1**: The number of code violations. (Two consecutive bipolar violations of the same polarity).
[Close]	Click to close the Port Current Statistics dialog box.
[Poll]	Click to refresh the data in the Port Current Statistics dialog box.

6.8 Viewing Port Intervals Statistics

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. The **Interval** statistics command displays intervals statistics for the selected E1 or T1 port, in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view a list of statistics from previous intervals:**

1. Click an E1/T1 port.
2. Select **Statistics > Interval...**

   The Port Intervals Statistics dialog box appears.

   The results of the previous intervals are displayed in the Port Intervals Statistics table, below the graph.

Note

- *If system is running less than fifteen minutes, the following message is displayed: "**System is up less than 15 min. No intervals data**."*
- *After 900 or more Unavailable Seconds, the Ratios (AR, ESR, and SESR) display **0**.*

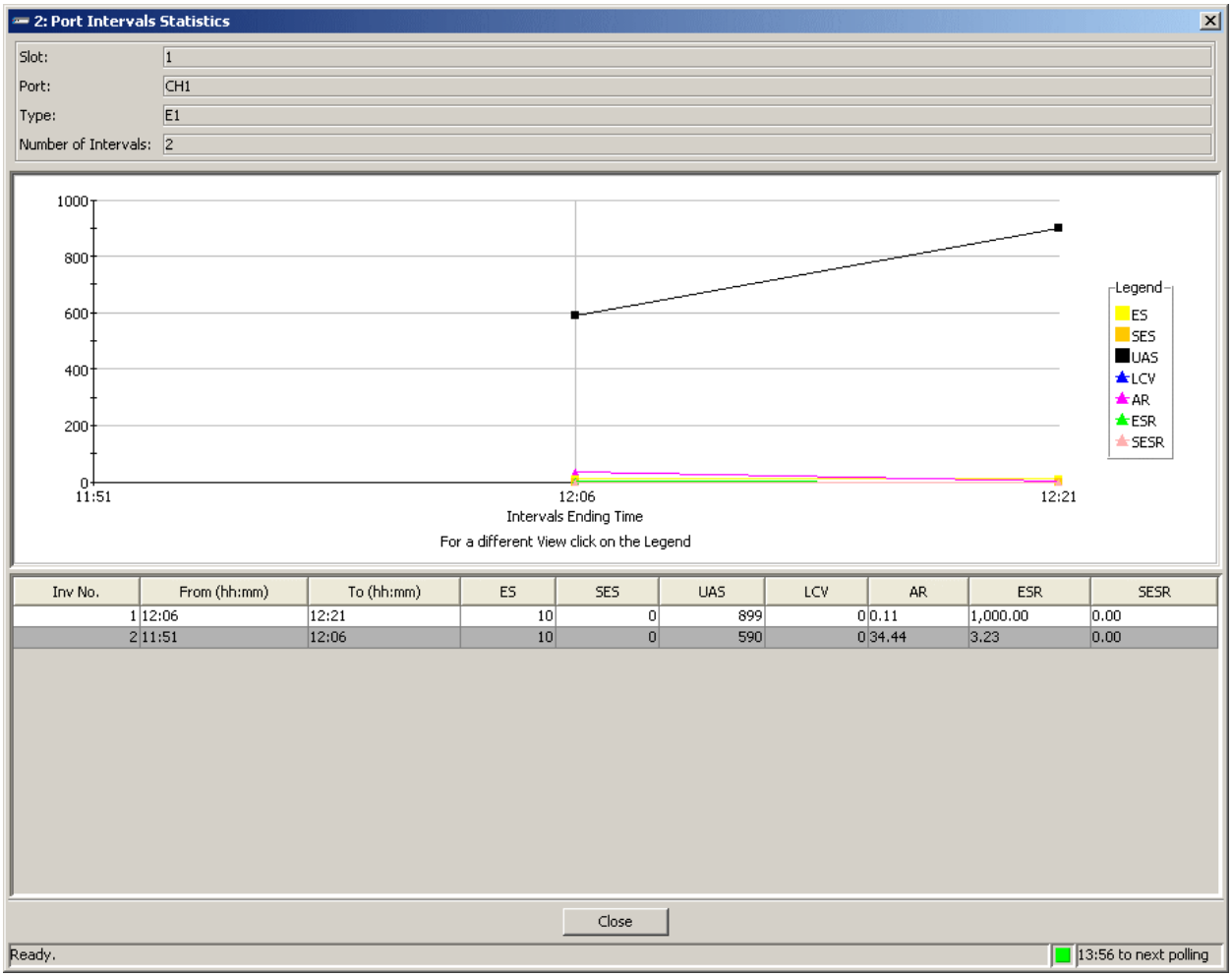

Figure 6-7. Port Intervals Statistics

Table 6-6. Port Intervals Statistics Parameters – E1/T1

Parameter	Remarks
Slot	**1**
Port	**CH1**
Type	**E1, T1**
Number of Intervals	Number of intervals sampled
Inv No.	Interval Number
From (hh:mm)	Starting time of the interval
To (hh:mm)	Ending time of the interval
ES	Errored Seconds A second containing one or more of the following events: CRC error, SEF (OOF), or AIS. ***Note:*** • *An OOF defect is the occurrence of a framing bits error.* • *If SES also occurs at the same time, ES will stop after 10 seconds.*

Parameter	Remarks
SES	Severely Errored Seconds 320 or more CRC error events, one or more SEF (OOF), or AIS. OOF defect indicates a framing bits error.
UAS	Unavailable Seconds Number of seconds that the interface is unavailable. The system is unavailable after 10 continuous SES.
LCV	Line Code Violations **For T1**: The sum of BPV and EXZ defects that occurred in a second. BPV is the occurrence of a zero string greater than 15 (for AMI) or 7 (for B8ZS). EXZ is the occurrence of a pulse of the same polarity as the previous pulse. **For E1**: The number of code violations. (Two consecutive bipolar violations of the same polarity).
AR	Availability Ratio
ESR	Errored Seconds Ratio
SESR	Severely Errored Seconds Ratio
[Close]	Click to close the Port Intervals Statistics dialog box.

6.9 Viewing Ethernet Port Statistics

The Ethernet **Interface Statistics** command enables you to view statistics for the selected Ethernet port. The aggregate statistics for the port are displayed in a dialog box. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view Ethernet interface statistics:**

1. Click the User or Network Ethernet interface.
2. Select **Statistics > Interface Statistics...**

   The Ethernet Interface Statistics dialog box appears.

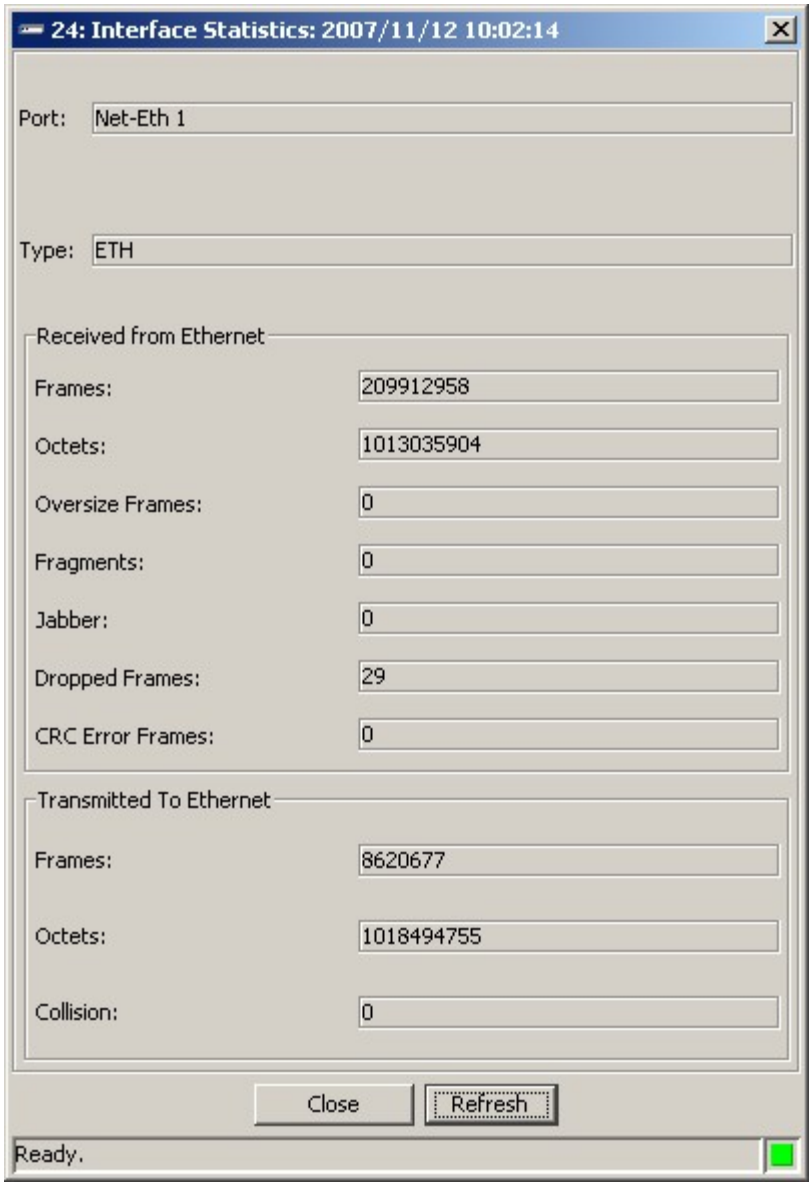

Figure 6-8. Interface Statistics Dialog Box

Table 6-7. Interface Statistics Parameters

Parameter	Possible Values / Remarks
Port	Net 1, Net/User 2, User 3
Type	ETH
Received from Ethernet	
Frames	The total number of packets received (including bad packets, broadcast packets, and multicast packets)
Octets	The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets)

Transmitted to Ethernet	
Frames	Total number of frames successfully transmitted
Octets	Total number of octets successfully transmitted
[Close]	Click to close the Interface Statistics dialog box.
[Refresh]	Click to refresh the information in the Refresh dialog box.

Chapter 7

Fault Management

This chapter describes how to manage IPmux-24 alarms and how to run a loopback test, and contains the following sections:

- *Monitoring Object Status*
  - *Masking Traps*
  - *Viewing Active Alarms*
  - *Viewing the History Log*
  - *Clearing the History Log*
  - *Viewing Self Test Results*
- *Performing Loopback Tests*

7.1 Monitoring Object Status

This section discusses monitoring the status of network objects including managing alarms.

Masking Traps

The **Masking Traps** command enables you to select which SNMP traps should be masked (disabled). You can mask a trap in order to prevent a known problem from causing repeated alerts at the network monitoring station and to enable focusing on new problems that may arise. All traps can be selected or deselected for masking as a group, or they can be selected individually.

➤ **To manually select traps for masking:**

1. Select **Options > Masking Traps...**.

   The Masking Traps dialog box appears (see *Figure 7-1*).

2. Select which traps to mask (for an explanation, see *Table 7-1*), and then click <**Set**>.

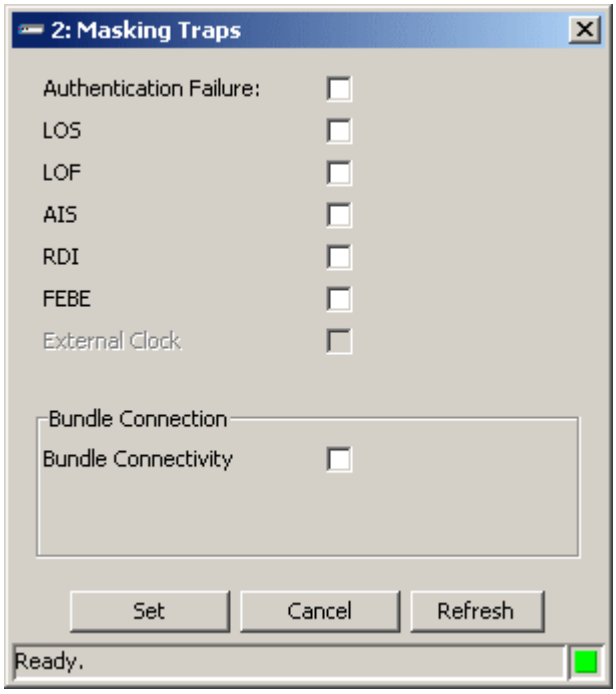

Figure 7-1. Masking Traps Dialog Box

Table 7-1. Masking Traps Parameters

Parameter	Possible Values/Remarks
Authentication Failure	Selecting this checkbox disables the Authentication Failure trap.
LOS	Selecting this checkbox disables the LOS trap.
LOF	Selecting this checkbox disables the LOF trap.
AIS	Selecting this checkbox disables the AIS trap.
RDI	Selecting this checkbox disables the RDI trap.
FEBE	Selecting this checkbox disables the FEBE trap.
External Clock	Selecting this checkbox, if available, disables the External Clock trap. ***Note:*** *This parameter is only enabled when an external clock is operational.*
Bundle Connection	
Bundle Connectivity	Selecting this checkbox disables the Bundle Connectivity trap.
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Viewing Active Alarms

The **Alarms** command enables you to view agent alarms from the time that the selected IPmux-24 was turned on or from the last time the active alarm list was cleared. Use this command to locate problems and as a troubleshooting aid.

➤ **To view the Active Alarm List:**

- Select **Fault > Alarms...**.

  The Active Alarm list appears (see *Figure 7-2*).

  For a description of the parameters, refer to *Table 7-2*.

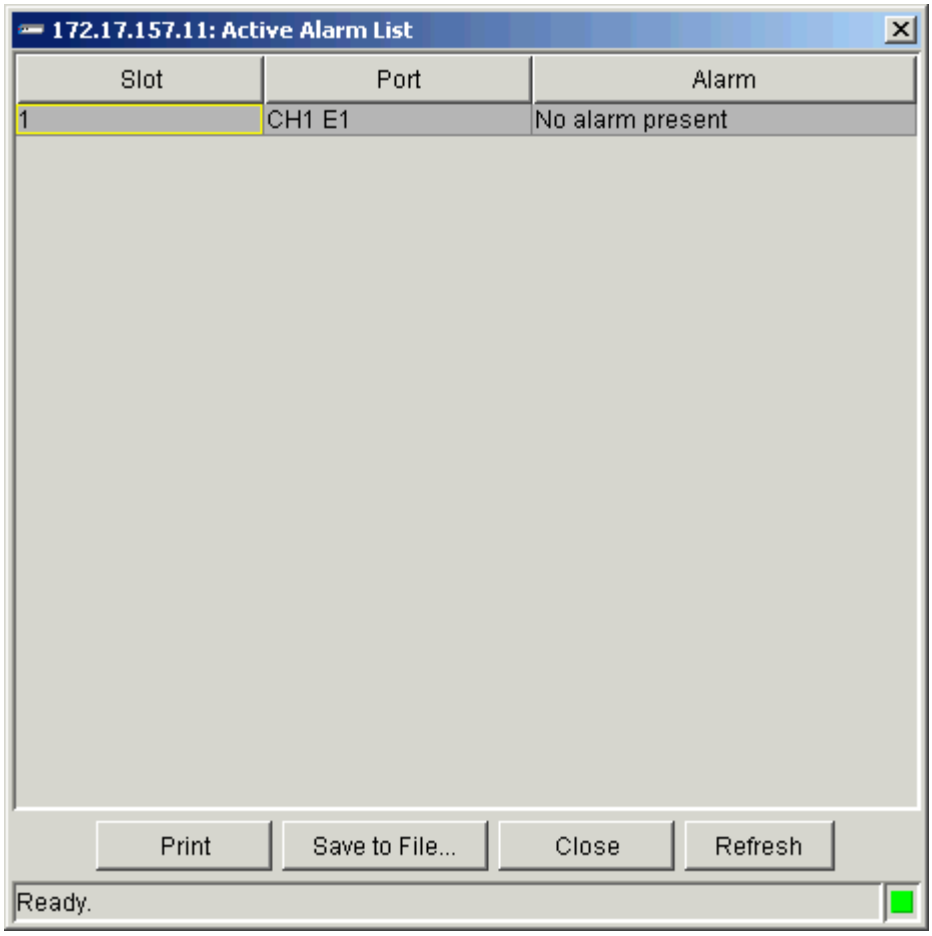

Figure 7-2. Active Alarm List

Table 7-2. Active Alarm Parameters

Parameter	Possible Values/Remarks
Slot	**1**
Port	The type of port **T1/E1**
Alarm	The type of Alarm Port alarms: **Far End LOF, Far End Sending AIS, Near End LOF, Near End Loss of Signal, Near End Sending TS16 LOMF**
[Print]	Click to print the Active Alarm list.
[Save to File...]	Click to save the Active Alarm list to a file.
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

Viewing the History Log

The **History Log** command enables you to display a history of alarms (up to 512 entries) that were sent from the selected IPmux-24 to the network management station. Use this command to locate problems and as a troubleshooting aid.

➤ **To view the History Log:**

- Select **Fault > History Log > List...**.

  The System Log Buffer table appears (see *Figure 7-3*).

  For a description of the parameters, refer to *Table 7-3*.

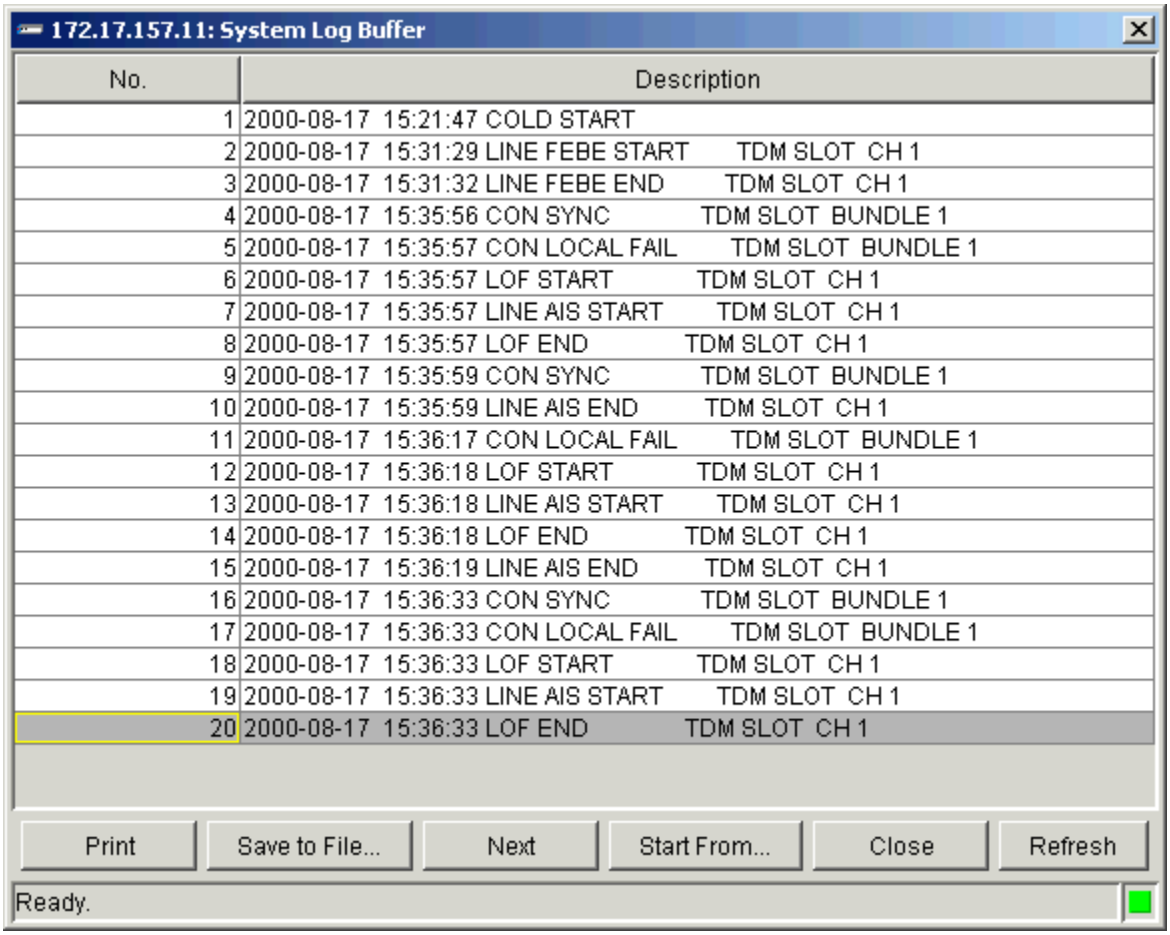
172.17.157.11: System Log Buffer
No.
Description
1 2000-08-17 15:21:47 COLD START
2 2000-08-17 15:31:29 LINE FEBE START TDM SLOT CH 1
3 2000-08-17 15:31:32 LINE FEBE END TDM SLOT CH 1
4 2000-08-17 15:35:56 CON SYNC TDM SLOT BUNDLE 1
5 2000-08-17 15:35:57 CON LOCAL FAIL TDM SLOT BUNDLE 1
6 2000-08-17 15:35:57 LOF START TDM SLOT CH 1
7 2000-08-17 15:35:57 LINE AIS START TDM SLOT CH 1
8 2000-08-17 15:35:57 LOF END TDM SLOT CH 1
9 2000-08-17 15:35:59 CON SYNC TDM SLOT BUNDLE 1
10 2000-08-17 15:35:59 LINE AIS END TDM SLOT CH 1
11 2000-08-17 15:36:17 CON LOCAL FAIL TDM SLOT BUNDLE 1
12 2000-08-17 15:36:18 LOF START TDM SLOT CH 1
13 2000-08-17 15:36:18 LINE AIS START TDM SLOT CH 1
14 2000-08-17 15:36:18 LOF END TDM SLOT CH 1
15 2000-08-17 15:36:19 LINE AIS END TDM SLOT CH 1
16 2000-08-17 15:36:33 CON SYNC TDM SLOT BUNDLE 1
17 2000-08-17 15:36:33 CON LOCAL FAIL TDM SLOT BUNDLE 1
18 2000-08-17 15:36:33 LOF START TDM SLOT CH 1
19 2000-08-17 15:36:33 LINE AIS START TDM SLOT CH 1
20 2000-08-17 15:36:33 LOF END TDM SLOT CH 1
Print
Save to File...
Next
Start From...
Close
Refresh
Ready.

Figure 7-3. System Log Buffer

Table 7-3. System Log Buffer Parameters

Parameter	Possible Values/Remarks
No.	The number of the alarm in the log buffer
Description	Brief description of the alarm Up to 80 characters
[Print]	Click to print the System Log Buffer.
[Save to File...]	Click to save the System Log Buffer to a file.
[Next]	Click to view the next 20 entries.
[Start From...]	Click to view entries starting from a specific index number in the History Log.
[Close]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

➤ **To view entries, starting from a specific number, in the History Log:**

1. Click ‹**Start From...**›.
2. Select the starting number.
3. Click ‹**Set**›.

➤ **To print all the entries in the History Log:**

- Click <**Print**>.

Clearing the History Log

The **History Log > Clear** command enables you to erase all of the entries in the alarm history. This command is helpful for clearing out large numbers of entries for repeated alarms resulting from problems that have already been corrected or noted.

➤ **To clear the History Log:**

1. Select **Fault > History Log > Clear**.

   A confirmation box appears.

2. Click <**OK**> to confirm.

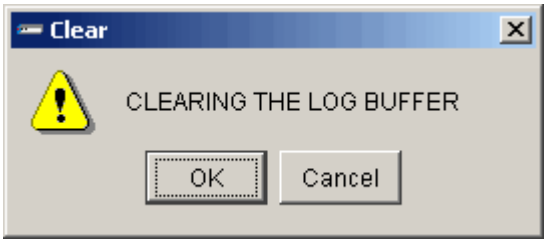

Figure 7-4. Clearing the Log Buffer Confirmation Message

Viewing Self Test Results

The **Self Test Results** command enables you to view the results of the IPmux-24 self-test. When the device is turned on, it checks itself. In case a fault is detected, this is noted in the Self Test Results log. Use this command as a troubleshooting aid to help determine the cause of an apparent device hardware or software failure.

➤ **To view Self Test results obtained when the selected IPmux-24 was powered up:**

- Select **Diagnostics > Self Test Results...**.

  The Self Test Results dialog box appears displaying descriptions of detected faults (see *Figure 7-5*).

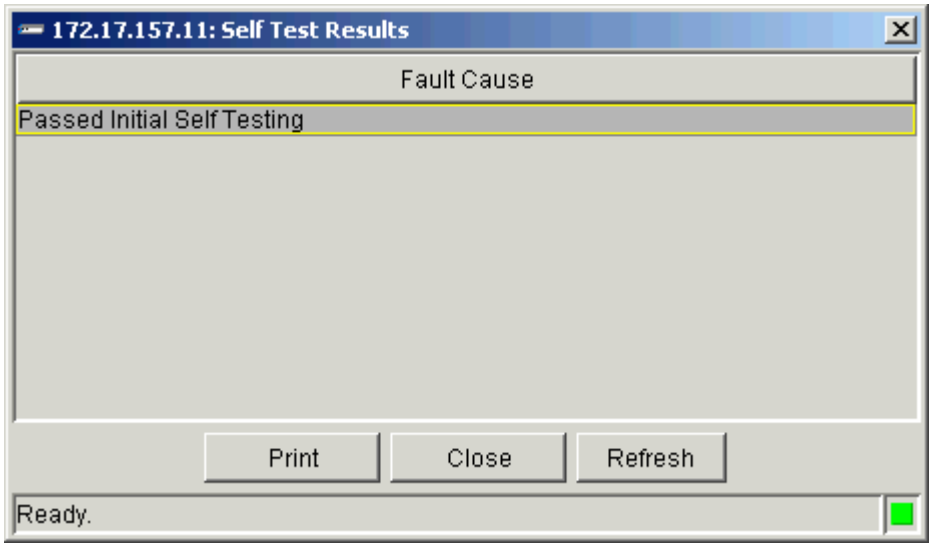

Figure 7-5. Self Test Results

7.2 Performing Loopback Tests

The **Loopback** diagnostics command enables you run loop tests on an E1 or T1 port, to troubleshoot data loss on a link and locate where the data is being lost in order to correct the problem.

➤ **To initiate a loopback test for an E1/T1 interface:**

1. Click an E1/T1 port.
2. Select **Diagnostics > Loopback...**

   The Interface Loopback dialog box appears (see *Figure 7-6*).
3. Set the desired loopback test, as described in *Table 7-4* and click <**Set**>.

The loopback test is performed.

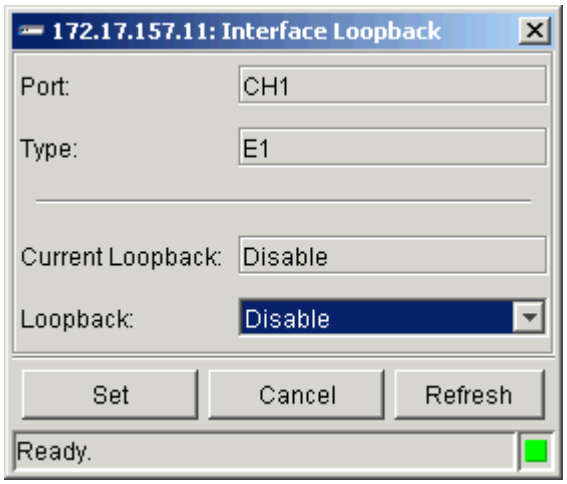

Figure 7-6. Interface Loopback State Dialog Box

Table 7-4. Interface Loopback Parameters

Parameter	Possible Values/Remarks
Port	Port number of the interface.
Type	**E1, T1**
Current Loopback	Current loopback status **Internal, External, Disable**
Loopback	Type of loopback test **Internal, External, Disable**
[Set]	Click to set and save the information.
[Cancel]	Click to close the window.
[Refresh]	Click to refresh the information in the window.

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